SESSIONAL PAPERS.

Volume XXXVIII. Part II.

Second Session of Eleventh Legislature

OF THE

PROVINCE OF ONTARIO.

And 2 maps in separate envelope

SESSION 1906.

TORONTO:
PRINTED AND PUBLISHED BY L. K. CAMERON
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1906

LIST OF SESSIONAL PAPERS.

ARRANGED ALPHABETICALLY.

Title.	No.	Remarks.
Accounts, Public	1	*Printed.*
Agricultural College, Report	14	"
Agricultural and Experimental Union, Report	15	"
Archives, Report	41	"
Asylums, Report	38	"
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Ballot Papers, fac similes	63	*Not printed.*
Bee-Keepers' Association, Report	20	*Printed.*
Births, Deaths and Marriages, Report	9	"
Brockville License Commissioners, Correspondence	6	*Not printed.*
Canadian Improvement Company, Agreement	80	*Printed.*
Central Prison, Rope and Cord Contract	65	"
" Woodware Contract	73	"
Children, Neglected, Report	43	"
Colonial Investment Company, Assets	78	*Not printed.*
Colonization, Report	32	*Printed.*
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" Sales since 1867	54	*Not printed.*
Dairymen's Association, Report	22	*Printed.*
Division Courts, Report	33	"
Education, Report of Minister	12	*Printed.*
" Orders in Council	51	*Not printed.*
" Teachers' Certificates	67	"
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Equitable Loan Company	78	*Not printed.*
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" Thames River	70	*Not printed.*
Fruit, Report	24	*Printed.*

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" Experiment Stations, Report	17	"
Fumigation Appliances, Report	18	"
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Health, Report	36	*Printed.*
Highways, Report	27	"
Home Guard, Fenian Raid, Certificates	64	*Not printed.*
Hospitals and Charities, Report	40	*Printed.*
Hydro-Electric Power Commission, Report	49	"
Indian Claim, Treaty No. 9	71	*Not printed.*
Industries, Report	28	*Printed.*
Insurance, Report	10	"
King's College, Endowment of Grants to, etc	53	*Not printed.*
Labour, Report	29	*Printed.*
Lands, Forests and Mines, Report	3	"
Land Titles, Report	75	*Not printed.*
Legal Offices, Report	34	*Printed.*
Library, Report	47	*Not printed.*
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Mining Divisions, O. in C	66	*Printed for distribution only.*
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Pigeon River, Timber Berth, Block D	72	"
Poultry Institute, Report	21	*Printed.*
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Queen Victoria Niagara Falls Park, Report...........	6	*Printed.*
Registrar-General, Report.........................	9	*Printed.*
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School of Practical Science, Calendar, 1906-7..........	60	*Printed for distribution only.*
St. Thomas, Audit, Correspondence..................	79	*Not printed.*
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Timber Berth, Block D, Pigeon River, Correspondence..	72	"
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Woodenware Contract, Central Prison	73	*Printed.*

LIST OF SESSIONAL PAPERS.

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No. 1. Public Accounts of the Province for the year 1905. Presented to the Legislature, February 27th, 1906. *Printed.*

No. 2. Estimates for the service of the Province until the Estimates of the year are finally passed. Presented to the Legislature 22nd February, 1906. *Not Printed.* Estimates for the year 1906. Presented to the Legislature 5th March, 1906. *Printed.* Estimates (Supplementary) for the year 1906. Presented to the Legislature, 9th May, 1906. *Printed.*

No. 3. Report of the Minister of Lands, Forests and Mines for the year 1905. Presented to the Legislature 11th April, 1906. *Printed.*

No. 4. Report of the Vegetable Growers' Association for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

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No. 5. Report of the Bureau of Mines for the year 1905. Presented to the Legislature, 24th April, 1906. *Printed.*

No. 6. Report of the Commissioners of the Queen Victoria Niagara Falls Park, for the year 1905. Presented to the Legislature, 27th February, 1906. *Printed.*

No. 7. Report of the Minister of Public Works for the year 1905. Presented to the Legislature, 4th April, 1906. *Printed.*

No. 8. Report of the Inspectors of Factories for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 9. Report relating to the Registration of Births, Marriages and Deaths for the year 1904. Presented to the Legislature, 20th February, 1906. *Printed.*

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No. 10. Report of the Inspector of Insurance for the year 1905. Presented to the Legislature, 19th March, 1906. *Printed.*

No. 11. Loan Corporations, Statements by Building Societies, Loan and other Companies, for the year 1905. Presented to the Legislature, 19th March, 1906. *Printed.*

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No. 12. Report of the Minister of Education, for the year 1905, with the Statistics of 1904. Presented to the Legislature, 20th February, 1906. *Printed.*

No. 13. Auditors' Report to the Board of Trustees, University of Toronto, on Capital and Income Accounts, for the year ending 30th June, 1905. Presented to the Legislature, 17th February, 1906. *Printed.*

No. 14. Report of the Ontario Agricultural College and Experimental Farm, for the year 1905. Presented to the Legislature, 21st February, 1906. *Printed.*

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No. 15. Report of the Ontario Agricultural and Experimental Union of the Province, for the year 1905. Presented to the Legislature, 8th March, 1906. *Printed.*

No. 16. Report of the Fruit Growers' Association of the Province, for the year 1905. Presented to the Legislature, 21st February, 1906. *Printed.*

No. 17. Report of the Fruit Experimental Stations of the Province, for the year 1905. Presented to the Legislature, 14th March, 1906. *Printed.*

No. 18. Report of the Inspector of Fumigation Appl'ances of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 19. Report of the Entomological Society, for the year 1905. Presented to the Legislature, 21st February, 1906. *Printed.*

No. 20. Report of the Bee-Keepers' Association of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 21. Report of the Poultry Institute of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 22. Reports of the Dairymen's Associations of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

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No. 23. Reports of the Live Stock Associations of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 24. Report on the Fruits of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 25. Report of the Farmers' Institutes of the Province, for the year 1905. Presented to the Legislature, 11th April, 1906. *Printed.*

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No. 26. Report of Ontario Fairs and Exhibitions of the Province, for the year 1905. Presented to the Legislature, 28th February, 1906. *Printed.*

No. 27. Report of the Commissioner of Highways, for the year 1905. Presented to the Legislature, 10th April, 1906. *Printed.*

No. 28. Report of the Bureau of Industries of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 29. Report of the Bureau of Labour, for the year 1905. Presented to the Legislature, 24th April, 1906. *Printed.*

No. 30. Report of the Ontario Game Commission, for the year 1905. Presented to the Legislature, 22nd March, 1906. *Printed.*

No. 31. Report of the Department of Fisheries, for the year 1905. Presented to the Legislature, 28th March, 1906.

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No. 32. Report on Colonization, for the year 1905. Presented to the Legislature, 9th May, 1906. *Printed.*

No. 33. Report of the Inspector of Division Courts, for the year 1905. Presented to the Legislature, 9th March, 1906. *Printed.*

No. 34. Report of the Inspector of Legal Offices, for the year 1905. Presented to the Legislature, 14th March, 1906. *Printed.*

No. 35. Report of the Inspector of Registry Offices, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 36. Report of the Provincial Board of Health, for the year 1905. Presented to the Legislature, 21st February, 1906. *Printed.*

No. 37. Report of the Secretary and Registrar of the Province, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 38. Report upon the Lunatic and Idiot Asylums of the Province, for the year ending 30th September, 1905. Presented to the Legislature, 21st February, 1906. *Printed.*

No. 39. Report upon the Prisons and Reformatories of the Province, for the year ending 30th September, 1905. Presented to the Legislature, 21st February, 1906. *Printed.*

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No. 40. Report upon the Hospitals and Charities of the Province, for the year ending 30th September, 1905. Presented to the Legislature, 21st February, 1906. *Printed.*

No. 41. Report upon the Archives of the Province, for the year 1905. Presented to the Legislature, 30th April, 1906. *Printed.*

No. 42. Report of the Royal Commission on the University of Toronto. Presented to the Legislature, 6th April, 1906. *Printed.*

No. 43. Report of Work relating to Neglected and Dependent Children of Ontario, for the year 1905. Presented to the Legislature, 20th April, 1906. *Printed.*

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No. 44. Report upon the Inspection of Liquor Licenses, for the year 1905. Presented to the Legislature, 20th February, 1906. *Printed.*

No. 45. Report of the Provincial Municipal Auditor, for the year 1905. Presented to the Legislature, 7th May, 1906. *Printed.*

No. 46. Supplementary Return from the Record of the several Elections in the Electoral Divisions of East Nipissing, Kingston and North Toronto, since the General Elections on January 25th, 1905, shewing: (1) The number of Votes Polled for each Candidate in the Electoral District in which there was a contest; (2) The majority whereby each successful Candidate was returned; (3) The total number of votes polled in each District; (4) The number of votes remaining unpolled; (5) The number of names on the Voters' Lists in each District; (6) The population of each District as shewn by the last Census. Presented to the Legislature, 2nd April, 1906. Printed.

No. 47. Report upon the state of the Library. Presented to the Legislature, 22nd March, 1906. *Not printed.*

No. 48. Report of the Temiskaming and Northern Ontario Railway Commission, for the year 1905. Presented to the Legislature, 1st March, 1906. *Printed.*

No. 49. Report of the Hydro-Electric Power Commission of the Province. Presented to the Legislature, 11th April, 1906. *Printed.*

No. 50. Copy of Order in Council approving of certain Regulations under Section 22 of the Succession Duties Act. Presented to the Legislature, 19th February, 1906. *Not printed.*

No. 51. Copies of Orders in Council under the provision of Section 9, Chapter 38, 1 Edward VII., *re* Education. Presented to the Legislature, 20th February, 1906. *Not printed.*

No. 52. Return, in part, to an Order of the House of the eleventh day of May, 1905, for a Return of, 1. Copies of all correspondence, documents, memoranda, instructions and circulars in connection with the appointment of license commissioners and inspectors for the present year, or in connection with their administration of their offices. 2. The names of all license inspectors who were dismissed, or have resigned during the present year and the reasons for their dismissals, or resignations, with the names of those appointed in their places. Presented to the Legislature, 20th February, 1906. Mr. *McDougal. Not printed.*

No. 53. Return to an Order of the House of the second day of May, 1905, for a Return shewing:—1. The original endowment or grants to King's College, Toronto, in (*a*) Lands. (*b*) Money. 2. The amount derived from sale of land by King's College, or University College, Toronto, and statement of lands still owned by University College. 3. Statement shewing subsequent Legislative endowments, or grants, to University College or Toronto University in lands, or money. 4. (*a*) The property or funds at present held by, or in trust, for the University of Toronto, or University College, or any of the affiliated Colleges. (*b*) The present annual revenue from such property or funds. 5. Statement of expenditures, annually, on buildings and equipment, salaries and maintenance of Toronto University or University College for the last ten years. 6. The annual amount at present required for salaries and expenses of maintenance. 7. Statement of all legislative grants, or expenditures, for University purposes at any city in Ontario, other than Toronto. Presented to the Legislature, 20th Februray, 1906. Mr. *Calder. Not printed.*

No. 54. Return to an Order of the House of the third day of May, 1905, for a Return shewing, by Counties, the amounts due the Province on acount of unpaid balances, due on sales of Crown Lands, from Confederation down to December 31st, 1904. Presented to the Legislature, 20th February, 1906. Mr. *Smith (Sault Ste. Marie.) Not printed.*

No. 55. Return to an Address to His Honour the Lieutenant-Governor, of the eighteenth day of May, 1905, praying that he will cause to be laid before the House a Return of copies of all Orders-in-Council, documents, correspondence and memoranda regarding the withdrawal of lots in the townships of McClure, Herchel, Dungannon, Mount Eagle, Mayo, Limerick, Cardiff, Farraday and Chandos, from sale or location, or other disposition, for a period of twenty-five years. Presented to the Legislature, 28th February, 1906. Mr. *Smyth. Not printed.*

No. 56. Copies of Orders-in-Council under ss. 2 of section 84 of the Surrogate Courts Act. Presented to the Legislature, 2nd March, 1906. *Not printed.*

No. 57. Copy of Order-in-Council authorizing the payment of surplus Surrogate fees to His Honour Judge Jamieson, Junior Judge of Wellington. Presented to the Legislature, 6th March, 1906. *Not printed.*

No. 58. Return to an Order of the House of the first day of March, 1906, for a Return shewing, 1. The names of all officers, attendants, or other officials of the Asylums, Prisons and other Public Institutions of the Province, under the Department of the Provincial Secretary, receiving perquisites, allowances or payments of any nature whatever, whether in cash, goods or supplies, beyond the amount voted for their salaries in the Estimates. 2. The nature and amount of such perquisites, allowances or payments received by such officer or other official. Presented to the Legislature, 6th March, 1906. Mr. *Dunlop.* *Printed for distribution to Members only.*

No. 59. Return to an order of the House of the twenty-seventh day of February, 1906, for a Return shewing—1. How many persons, in Ontario, were commissioned to issue Marriage Licenses on the 7th day of February, 1905. 2. How many of such persons have had their authority revoked since such date. 3. How many persons have been commissioned to issue Marriage Licenses, in Ontario, between the 7th day of February, 1905, and the 7th day of February, 1906. Presented to the Legislature, 7th March, 1906. Mr. *Ross.* *Not printed.*

No. 60. Calendar of the Ontario School of Practical Science for the year 1906-7. Presented to the Legislature, 16th March, 1906. *Printed for distribution only.*

No. 61. Return to an Order of the House of the fourteenth day of March, 1906, for a Return of Copies of all correspondence, papers and documents between the Attorney-General, or other Member of the Government, and A. M. Panton and others, in the year 1903, in any way relating to the action at law brought by Mr. Scully, against Mr. Peters for malicious prosecution. Presented to the Legislature, 20th March, 1906. Mr. *Torrance.* *Not printed.*

No. 62. Return to an Order of the House of the eleventh day of May, 1905, for a Return shewing the amount received in each of the last five years for Market Fees in Cities and Towns situated in Counties in which Toll Roads exist, or have existed during the past five years. And shewing as well what reductions, if any have been made in the respective market fees by Towns and Cities situated in Counties in which Toll Roads have been abolished during the past five years. Presented to the Legislature, 22nd March, 1906. Mr. *Thompson* (*Wentworth.*) *Not printed.*

No. 63. Return to an Order of the House of the twenty-first day of March, 1906; That the Clerk of the House, *ex-officio*, Clerk of the Crown in Chancery, do lay upon the Table of the House, facsimiles of the Ballot papers furnished to the Returning Officers and Deputy Returning Officers, and used in the recent Bye Elections in the City of Kingston and in the North Riding of the City of Toronto. Presented to the Legislature, 23rd March, 1906. Mr. *Pense*. *Not printed.*

No. 64. Return to an Address to His Honour the Lieutenant-Governor of the sixteenth day of March, 1906, praying that he will cause to be laid before the House a Return of copies of all correspondence with the Government, or any member thereof, together with a copy of any Orders in Council, in the matter of granting Certificates to the Home Guard acting during the Fenian Raid in the year 1866. Presented to the Legislature, 27th March, 1906. Mr. *Smyth*. *Not printed.*

No. 65. Copy of an Agreement between the Province and William Bernard Converse, of Montreal, conditioned for the manufacture of rope and cord at the Central Prison. Presented to the Legislature, 11th April, 1906. *Printed.*

No. 66. Copies of Orders in Council under the provisions of R.S.O., 1897, Chapter 36, Section 8, *in re* Mining Divisions. Presented to the Legislature, 28th March, 1906. *Printed for distribution only.*

No. 67. Return to an Order of the House of the sixteenth day of March, 1906, for a Return shewing the number of:—1. Part II. Junior Leaving and Junior Teacher's Certificates. 2. Part I. Senior Leaving and Part I. Senior Teacher's Certificates, and 3. Part II. Senior Leaving and Part II. Senior Teacher's Certificates, obtained at each of the following centres, at the examinations of 190-'01-'02-'03-'04 and '05, *viz.*—Barrie, Belleville, Berlin, Brantford, Chatham, Cobourg, Collingwood, Galt, Guelph, Hamilton, Kingston, Lindsay, London, Morrisbug, Ottawa, Owen Sound, Perth, Peterborough, Renfrew, Sarnia, Stratford, Toronto (Harbord Street), Toronto (Jamieson Avenue), Toronto (Jarvis Street), Harriston, Meaford, Mount Forest, Orangeville and Port Hope. Presented to the Legislature, 28th March, 1906. Mr. *MacKay*. *Not printed.*

No. 68. Copies of correspondence in the matter of the sale of $6,000,000 six months' Treasury Bills, at a rate of discount not exceeding four *per cent.*, and to the subsequent issue of Government Bonds or Stock. Presented to the Legislature, 29th March, 1906. *Printed.*

No. 69. Return to an Order of the House of the twenty-third day of March, 1906, for a Return of copies of all correspondence between the Chairman of the Board of License Commissioners of the Town of Brockville; the License Inspector, or any citizen of the Town and the Government, or any Member thereof, or the

License Department, with reference to the enforcement or non-enforcement of the Liquor License Act, or to the granting, or withholding, of Licenses to the Imperial Hotel, or to Samuel Johnston. Presented to the Legislature, 3rd April, 1906. Mr. *Graham*. *Not printed.*

No. 70. Return to an Order of the House of the twenty-third day of March, 1906, for a Return shewing the number of fishing licenses granted on the River Thames, east of the City of Chatham, during the years 1904, 1905 and 1906; the Revenue received each year, and whether the fish were sold in Canada or the United States, and whether the fish were taken with nets, and if so, of what description. Presented to the Legislature, 3rd April, 1906. Mr. *Ross*. *Not printed.*

No. 71. Return to an Address of His Honour the Lieutenant-Governor, of the ninth day of March, 1906, praying that he will cause to be laid before the House a Return of copies of all papers and correspondence regarding the settlement of the Indian claim of Northern Ontario, known as Treaty No. 9, together with a copy of the Treaty as finally agreed upon. Presented to the Legislature, 6th April, 1906. Mr. *Ross*. *Not printed.*

No. 72. Return to an Address to His Honour the Lieutenant-Governor, of the twenty-third day of March, 1906, praying that he will cause to be laid before the House copies of all Orders in Council, papers and correspondence in any way relating to the cancellation of the license of timber berth, Block D., Pigeon River, held by J. Murphy, which stands in the Public Accounts, 1905, page 319, as a charge of $18,787.10. Presented to the Legislature, 10th March, 1906. Mr. *McDougal*. *Not printed.*

No. 73. Copy of an Agreement between the Province and Ellen Charlotte Scott, of Toronto, trading under the name of Taylor, Scott & Co'y, respecting the manufacture of wooden ware at the Central Prison. Presented to the Legislature, 18th April, 1906. *Printed.*

No. 74. Return to an Order of the House, of the sixth day of April instant, for a Return of copies of all correspondence between the License Inspector of North Renfrew, or any member of the Board of License Commissioners, or af any citizen of Pembroke, and the License Department, or any Member of the Government, with reference to the granting of a liquor license at Petewawa. Presented to the Legislature, 12th April, 1906. Mr. *Graham*. *Not printed.*

No. 75. Report of the Land Titles Office for the years 1903, 1904 and 1905. Presented to the Legislature, 27th April, 1906. *Not printed.*

No. 76. Return to an Order of the House of the fourth day of April, 1906, for a Return giving a complete list of all books on the authorized list for public and high schools, with dates of authorization; names of authors; positions occupied by them; with the Royalties, or other considerations, paid to them, respecting such books and the selling price thereof, and how prices are arranged. Presented to the Legislature, 1st May, 1906. Mr. *Craig*. *Printed*.

No. 77. Statement of distribution of Revised and Sessional Statutes, from 31st December, 1904, to 31st December, 1905. Presented to the Legislature, 1st May, 1906. *Not printed*.

No. 78. Return to an Order of the House of the twenty-third day of April, 1906, for a Return shewing: 1. On what terms the assets of the Equitable Loan Company were taken over by the Colonial Investment and Loan Company and what percentage was paid in stock of Colonial Company to holders of terminating stock in Equitable Loan Company. 2. The names and addresses of Directors and officials of the Colonial Investment and Loan Company. 3. The names and addresses of the Directors and officials of Imperial Trusts Company. Presented to the Legislature, 7th May, 1906. Mr. *Jamieson*. *Not printed*.

No. 79. Return to an Order of the House, of the first day of May, 1906, for a Return of copies of all correspondence between the Municipal Council of the City of St. Thomas, or any official thereof and any other person or persons, proposing to the Government, or any official thereof, to have a special audit of the books of the Municipality of St. Thomas. Presented to the Legislature, 7th May, 1906. Mr. *Macdiarmid*. *Not printed*.

No. 80. Copy of Agreement, Deed of Trust and Guaranty, made by and between His Majesty the King and the Canadian Improvement Company and others. Presented to the Legislature, 9th May, 1906. *Printed*.

REPORT OF THE BUREAU OF MINES 1906

VOL. XV PART I

CONTENTS

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY
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ILLUSTRATIONS.

MAPS.

To His Honor William Mortimer Clark, &c., &c., &c.,

Lieutenant-Governor of the Province of Ontario.

Sir:—

I have the honor to transmit herewith for presentation to the Legislative Assembly, the Fifteenth Report of the Bureau of Mines.

I have the honor to be, Sir,

Your obedient servant,

F. Cochrane,

Minister of Lands and Mines.

Department of Lands and Mines,
Toronto, 24th April, 1906.

TO THE HONORABLE FRANK COCHRANE,
Minister of Lands and Mines.

SIR:—

I beg to submit herewith, to be presented to His Honor the Lieutenant-Governor, the Fifteenth Annual Report of the Bureau of Mines.

The Report consists of two Parts.—Part I, which passes in statistical review the mining industries of the Province for the year 1905, gives the reports of the instructors of Summer Mining Classes, and of the Inspector of Mines upon the mining properties actually under operation, and presents articles upon Natural Gas and Petroleum, Exploration in Mattagami Valley, Agricultural Resources of Mattagami, The Animikie Iron Range, and the Iron Ranges of Eastern Michipicoten; and Part II, which deals with Clay and the Clay Industry of Ontario.

I have the honor to be, Sir,

Your obedient servant,

THOS. W. GIBSON,
Director.

OFFICE OF THE BUREAU OF MINES,
TORONTO, 24th April, 1906.

REPORT OF
THE BUREAU OF MINES
1906

Vol. XV. **Part I.**

By Thos. W. Gibson, Director

Statistical Review

The mineral production of the Province of Ontario for the year 1905, including in that term the output of the mines, metallurgical works, brickyards, quarries, etc., amounted in value to $17,809,226, at the prices payable for the several products at the mines and works. As compared with the production of 1904, this represents an increase of about 54 per cent., a notable advance, and much the largest total of any year in the history of the mining industry in this Province. Table No. 1 gives a summary of the production, showing also that the number of employees and wages paid for labor, which in 1904 were 10.491 and $3,838.583 respectively had increased to 11.151 and $5.082.653.

Table I.—Mineral Production, 1905

Product.	Quantity	Value $	Employees No.	Wages $
(a)—Metallic				
Gold .... ounces	5,770	99,885	279	175,818
Silver .... "	2,473,452	1,372,877	475	191,582
Cobalt .... tons	118	100,000		
Nickel .... "	9,503	3,354,934		
Copper .... "	4,525	688,993	1,175	833,822
Platinum metals .... ounces	1,562	28,116		
Lead .... tons	141	9,000	16	10,000
Iron Ore .... "	211,597	227,909	278	164,153
Pig Iron .... "	256,704	3,909,527	1,684	1,131,078
Steel .... "	138,387	3,321,884		
		13,113,125		
Less value Ontario iron ore smelted into pig iron, and Ontario pig iron converted into steel:		2,912,115		
Net metallic production		10 201,010	3,907	2,506,453
(b)—Non-Metallic				
Arsenic .... tons	549	2,693	(c)	(c)
Brick, common .... number	250,000,000	1,937,500		815,000
Tile, drain .... "	15,000,000	220,000		
Brick, pressed .... "	26,000,000	234,000	215	85,000
" paving .... "	4,500,000	54,000	60	28,000
Building and crushed stone	....	700,000	1,400	500,000
Calcium carbide .... tons	2,427	156,755	80	35,600
Cement, Portland .... bbls	1,251,360	1,783,451	945	504,122
" natural rock .... "	14,741	10,402	33	4,453
Corundum .... tons	1,681	152,464	216	109,128
Feldspar .... "	12,234	29,968	52	19,200
Graphite .... "	2,078	9,825	46	13,375
Gypsum .... "	2,353	4,118	13	1,614
Iron pyrites .... "	7,325	21,885	68	27,690
Lime .... bush.	3,100,000	424,700	500	165,000
Mica .... tons	315	50,446	104	27,520
Natural gas	....	316,476	130	88,865
Peat fuel .... tons	400	1,200	5	525
Petroleum .... imp. gal.	22,131,658	(d) 898,545	(e)	(e)
Pottery	....	60,000	65	20,000
Salt .... tons	60,415	356,783	148	68,580
Sewer pipe	....	225,835	55	62,078
Talc .... tons	1,120	2,240	9	650
Total non-metallic production		7,653,286	7,244	2,576,200
Add net metallic production		10,201,010	3,907	2,506,453
Total production		17,854,296	11,151	5,082,653

(c)—Included in silver and cobalt. (d)—Not including Dominion Government bounty of $331,975. (o)—Not reported.

The usage of the Bureau of Mines from the first has been to compute the value of the mineral products of the country on the basis of their selling value at the mines or works. Thus, iron ore is taken for statistical purposes at its worth at the pit's mouth —not at its value at the blast furnace, with the charges for transportation and middleman's profits, if any, added; nickel and copper in the mattes of Sudbury are estimated at their value in that condition and at the place of production, not at their market price as refined metals after having incurred all the costs of the processes of separation; silver is valued at the sums actually received by the mine-owners for their ore marketed in New York or elsewhere, not on the current price of fine silver; and so throughout the list. It is believed that in this way the actual value of the products as factors in the industries of our own country are more closely approximated, than by a method which attributes to them a value largely the result of the application of labor and capital to them outside the limits of Canada. For instance, the cobalt contents of the silver ores mined in the Cobalt camp are at present worth little or nothing to the producers of these ores, simply because they get little or nothing for them from the ore buyers. It is hardly correct then to estimate these cobalt contents, for purposes of Ontario statistics, as being worth the selling price of cobalt oxide, say \$2.25 or \$2.50 per pound. Again, the nickel and copper of the Sudbury mattes sell, when separated and refined, for say 40 or 50 cents per pound for nickel and 18 or 20 cents per pound for copper. But the refining and separating are done in the United States and Wales, and the additional value thus given to the crude materials is surely to be credited to these countries, and not to Ontario, the place of origin. However, this is not the view acted upon in compiling the statistics of some of the other Provinces of the Dominion by the Provincial authorities, or by the Geological Survey of Canada in making up the figures for the Dominion as a whole. Statistics being used largely for purposes of comparison, the result is that when the official figures for Ontario and say British Columbia are compared, the difference in the statistical methods employed gives an erroneous impression of the relative importance of the mining industry of this Province. In order that this may be clearly seen, and also to provide the means of making a fair comparison between the mineral statistics of Ontario and those of any other Province or Provinces, the following table is given in which the metallic products of Ontario for 1905 are valued at nearly the market prices of the refined metals, and the non-metallic products, most of which are not susceptible of more than one method of valuation, are taken at their "spot" value, as in Table I.

Table II.—Mineral Production 1905; metals at prices of refined (nearly).

Product		Quantity	Price		Value $
Gold	ounces	5,770	(a) $17 20	per oz.	99,885
Silver	"	2,473,452	0 573	"	1,472,877
Cobalt	tons	118	(b) 2 25	per lb	675,000
Nickel	"	9,503	0 40	"	7,602,400
Copper	"	4,525	0 155	"	1,402,750
Platinum metals	ounces	1,562	18 00	" oz.	28,116
Lead	tons	141	0 042	" lb.	11,840
Iron Ore	"	211,597	1 08	per ton	227,909
Pig Iron	"	256,704	15 23	"	3,909,527
Steel	"	138,387	24 00	"	3,321,884
Total					18,752,188
Less deductions, per Table I					2,912,115
Metallic production					15,840,073
Add non-metallic production					7,653,286
Gross production					$23,493,359

(a)—No change owing to uncertainty of fineness of bullion. (b)—As cobalt-oxide, CoO, containing 78.66 per cent. Co.

The foregoing table is comparable with a similar table given in the Annual Report of the Minister of Mines, British Columbia, for 1905, p. J9, in which the prices for

silver, copper and lead are the same as those used above, and are stated to be, for the first, 95 per cent., and for the last 90 per cent., of the average price for the year in the New York metal market, treatment and other charges not being deducted; and with the schedule in "Mineral Production of Canada, 1905," issued by the Geological Survey at Ottawa, in which the following prices are assumed: copper, 15.590 cents per pound, lead, 4.707 cents per pound, nickel, 40 cents per pound, silver 60.352 cents per ounce. This basis of computation gives the aggregate value of the minerals produced in Ontario in 1905, after eliminating duplicated materials, such as iron ore smelted into pig iron and pig iron converted into steel, as $23,193,359, while the total for British Columbia for the same year was $22,461,325. These figures alone are sufficient to indicate the growing importance of mining in Ontario. It is rapidly taking its place as one of the leading industries of the Province.

The increased aggregate production for 1905 as compared with 1904 is chiefly due to advances in the output of the following products; silver from $111,887 to $1,372,877, nickel from $1,516,747 to $3,354,934, copper from $297,126 to $688,993, pig iron from $1,811,664 to $3,909,527, steel from $1,188,349 to $3,321,884, brick from $1,430,000 to $1,937,500, Portland cement from $1,239,971 to $1,783,451, and natural gas from $253,524 to $316,476. No important falling-off is shown in any product, either metallic or non-metallic.

It will be observed that while there has been a general increase throughout the large and varied list of minerals and mineral substances produced in Ontario, the chief increases have been in the metalliferous branches of the industry, the total output of metallic products in 1905 being valued at $10,201,010, as compared with $4,906,677 in 1904, an increase of over 100 per cent. The largest previous metallic output was in 1902, when it reached the sum of $6,257,499. For the first time, the metallic production has surpassed the non-metallic in aggregate value, and the excess is the decided figure of $2,547,724. The future of the mining industry in Ontario belongs to the metals and their ores.

The output of non-metallic substances holds its own, or shows a slow increase from year to year. The yield in 1905 exceeded that for 1904 by $987,316, and that for 1903 by $25,268. In the latter year, however, the value of petroleum products was included in the total instead of the value of the crude petroleum produced, as has been the case since that time. This much more than accounts for the difference.

Table No. III given below shows the value of the several mineral products for each of the last five years, and demonstrates the substantial growth now being made in the various departments of the industry.

Table III.—Mineral Production, 1901 to 1905

Product.	1901	1902	1903	1904	1905
	$	$	$	$	$
Metallic:					
Gold	244,143	229,828	188,036	40,000	99,885
Silver	84,830	58,000	8,949	111,887	1,372,877
Platinum				10,452	28,116
Palladium				18,564	
Cobalt				36,620	100,000
Copper	589,080	680,283	716,726	297,126	688,993
Nickel	1,859,970	2,210,961	2,499,068	1,516,747	3,354,934
Iron Ore	171,428	518,145	450,099	108,068	227,909
Pig Iron	1,701,703	1,683,051	1,491,696	1,811,664	3,909,527
Steel	347,280	1,610,031	304,580	1,188,349	3,321,884
Lead Ore				11,000	
Pig Lead			1,500	2,500	9,000
Molybdenite		400	1,275		
Zinc Ore	15,000	11,500	17,000	3,700	
	5,016,734	7,002,499	5,678,929	5,321,677	13,113,125
Less value Ontario iron ore smelted into pig iron, and pig iron converted into steel		745,000	436,354	250,000	2,912,115
Net metallic production	5,016,734	6,257,499	5,242,575	4,906,677	10,201,010

Table III.—Mineral Production, 1901 to 1905—*Continued.*

Product.	1901	1902	1903	1904	1995
Non-Metallic.	$	$	$	$	$
Actinolite	3,126	6,150	1,650	102	....
Arsenic	41,677	48,000	15,420	903	2,693
Brick, common	1,530,460	1,411,000	1,561,700	1,430,000	1,937,500
" paving	37,000	42,000	45,288	55,450	54,000
" pressed	104,394	144 171	218,550	226,750	234,000
Building and crushed stone	850,000	1,020,000	845,000	700,000	700,000
Carbide of calcium	168,792	89,420	144 000	152,295	156,755
Cement, natural rock	107,625	50,795	69,319	65,250	10,402
" Portland	563,255	916,221	1,182,799	1,239,971	1,783,451
Corundum	53,115	83,871	87,600	150,645	152,464
Feldspar	6,375	12,875	20,046	21,966	29,968
Graphite	20,000	17,868	20,636	4,700	9,825
Gypsum	13,400	19,149	7,910	10,674	4,118
Iron pyrites	17,500	14,933	21,693	43,716	21,885
Lime	550,000	617,000	520,000	406,800	424,700
Mica	39,780	102,500	102,205	37,847	50,446
Natural gas	342,183	199 228	196,535	253,524	316,476
Peat fuel	....	....	3,300	2,400	1,200
Petroleum products	1,467,940	1,431,054	1,586,674	904,437	898,545
Pottery	193,950	171,315	160,000	100,000	60,000
Salt	323,058	344,620	388,097	362,621	356,783
Sewer pipe	147,948	191,965	199,971	283,000	225,835
Talc	1,400	960	2,625	2,919	2,240
Tile, drain	231,374	199,000	227,000	210,000	220,000
Total non-metallic production	6,814,352	7,134,135	7,628,018	6,665,970	7,653,286
Add metallic production	5,016,734	6,257,499	5,242,575	4,906,677	10,201,010
Total production	11,831,086	13,391,634	12,870,593	11,572,647	17,854,296

Glancing at the progress of the mining industry or industries of the Province, as exhibited in the foregoing tables, especially during the past year, the principal products, both metallic and non-metallic, will be passed briefly in review. The first product on the list is

Gold

The yield of gold in Ontario in 1905 was not large, but showed a slight improvement over the low-tide figures of 1904, amounting to $99,885, as compared with $40,000. The chief producing companies were the St. Anthony Reef, on Sturgeon lake, the Shakespeare in the township of that name near Webbwood station on the Canadian Pacific railway, Algoma district, the Sultana on Lake of the Woods, and the Big Master on Manitou lake. Smaller quantities of bullion were turned out by the Star of the East and Craig gold mines in Eastern Ontario, and by the Camp Bay, Redeemer and Northern Light properties in the western district. Some very rich ore encountered in the shaft and first level of the Laurentian mine near Gold Rock, Manitou lake, has led to a revival of interest in that neighborhood, where a large number of locations were taken up for gold some years ago.

Details of the gold mining industry for the last five years are as follows:

Table IV.—Gold Mining, 1901 to 1905

Schedule	1901	1902	1903	1904	1905
Mines Worked ... No	11	20	19	12	13
Ore treated ... tons	54,336	48,544	32,347	....	17,510
Gold product ... oz	14,293	13,625	10,383	2,285	5,541
Gold value ... $	244,443	229,828	188,036	40,000	99,885
Men above ground ... No	305	341	243	100	175
Men under ground ... No.	288	385	250	130	134
Wages paid ... $	287,409	343,984	245,490	133,000	175,818

Silver

With the discovery of the high-grade ores of the Cobalt district in 1903, silver mining in Ontario entered upon a new lease of life. The production of silver in this Province has been from two districts, which though widely separated in distance, strongly resemble each other in the character and relationships of the ores. The first of these is on the northwest shore of lake Superior, including Silver Islet, where rich ore was discovered in 1868. This find was followed by others on the main land, and for a number of years the Beaver, Badger, Rabbit Mountain, Silver Mountain, Porcupine and other mines yielded large quantities of silver, in addition to the pioneer mine on Silver Islet, which was perhaps the richest of them all. The lowering price of silver led in time to the entire suspension of silver mining in the Lake Superior region, the West End Silver Mountain being the last mine to remain in operation, and producing bullion up to 1903. The ores of this district carried native silver, argentite, cobalt, nickel and arsenic, the same assemblage of minerals as are found in the veins of the Cobalt region, though the proportion of the three last is probably greater in the veins of Cobalt than in those of Lake Superior. The close resemblance which these deposits bear to each other, though not less than 300 miles apart, warrants the hope that in the intervening distance veins of a similar nature may yet be found. By far the larger part of this immense district, lying partly north of Lake Huron and partly north of Lake Superior, has been but little prospected away from the railway and leading canoe routes, and there is ample room here for other Silver Islets and Cobalts. The geology of the country does not forbid the occurrence of rich mineral wealth; on the contrary, the Huronian rocks which characterize a considerable part of it contain the greatest deposits of nickel ore in the world, much wealth of copper and iron and considerable gold, not to mention minor ores, such as those of cobalt, arsenic and sulphur.

DEVELOPMENT OF COBALT CAMP

The rise of the Cobalt mining camp has been rapid. Indeed, almost all the requisites for speedy development were found united here. The richest of ores outcropping at the surface, a railway running through the centre of the camp to bring in supplies and carry the ores to market at reasonable rates, abundance of wood for timber and fuel, plenty of labor and law and order well maintained, have combined to afford almost every facility a mining camp could require. Yet the news of the extraordinary riches found on the banks of Cobalt lake (then known as Long lake) by Prof. Miller, the Provincial Geologist, in the fall of 1903, though promptly published, excited for a time only a languid interest. The public had been through one or two mining booms and were not anxious for another; it was difficult for many to believe that ores of the character reported could exist in any quantity in a district from which nothing of the kind had hitherto come; and consequently the magnificent collection of specimens showing native silver in nuggets many pounds in weight, and profusely interspersed throughout solid blocks of smaltite and niccolite, with which Mr. Miller returned and which were kept displayed in the office of the Bureau of Mines and at the door of the Legislative chamber during the winter of 1903-4, attracted comparatively little attention.

Nor was this indifference confined to the general public, the great proportion of whom lack the necessary qualifications for judging the nature and value of ores or minerals, but even mining men at first failed to appreciate the significance and importance of the new finds. The collection of ores and specimens mentioned above was exhibited at the annual meeting of the Canadian Mining Institute held in Toronto in March 1904, but the feeling aroused was curiosity rather than interest and while the samples were regarded as excellent specimens, there was much skepticism as to the existence of a new silver field of any importance. The consequence was that the spring or even the summer of 1904 saw comparatively few prospectors in the Cobalt

region, and though the opening up of the four veins which had been found in 1903 afforded indubitable evidence of the value of the discoveries, yet even at the close of the season of 1904 there was so much good prospecting ground unlocated within a short distance of the original finds that a speculator in the month of December had no difficulty in filing claims on some ten or twelve well-situated properties, or another in repeating the operation in the month of March 1905.

But the results of the prospecting in 1904 convinced the most incredulous that the Cobalt camp was one of the richest that had ever been found in the history of silver mining in America, and the result was that in 1905 the region swarmed with prospectors, and every available foot of land within miles of the first discoveries was taken up, or at any rate claimed on the strength of an alleged find of "valuable mineral." The indifference quickly changed to feverish anxiety for the possession of a claim; stakes were planted and discoveries sworn to in the snow, in the swamps, in soil where no rock was visible, on any unclaimed forty acres that could be found for miles in any direction. With all this, there was an immense amount of genuine, hard prospecting.

PROSPECTING FOR VEINS

The earnestness with which these veins were sought for arose from the fact that a good find was practically sufficient to make a prospector rich for life, and the quest for veins was pursued with an ardor that stopped at no difficulty, however great. These difficulties were neither few nor small. One of the chief consisted in the nature of the territory itself. In many places the rock is covered several feet deep with soil, and everywhere it is obscured by moss, debris and small timber, the larger trees having for the most part been already removed by the lumberman. Under such circumstances prospecting for veins partook more of the nature of ditching than anything else, and in numberless instances trenches several feet in depth and many feet in length attested the zeal with which the prospectors labored. For the most part the surface of the ground afforded no indication of the presence or absence of minerals in the underlying rock, hence the trenches had to be run in a haphazard way as to direction. In addition, the veins themselves are usually narrow, sometimes not more than an inch or even half an inch in width, and frequently in their undisturbed condition give little or no evidence of containing minerals, hence every inch of rock uncovered demanded the most minute inspection lest after tons of earth had been removed, the object of the search might after all escape detection.

In addition to these natural conditions, the mining laws themselves tended strongly to make the actual discovery of valuable mineral in place an object of supreme importance to the prospector. The locking up of favorable ground on the strength of fictitious discoveries during the season of 1904 proved so serious an evil that the public sentiment of the camp, as expressed at a miners' meeting held at Cobalt in the spring of 1905, demanded a remedy to be found, and suggested the appointment of official inspectors whose duty it should be to pass upon all discoveries on the strength of which claims were staked and recorded. The law required a discovery of valuable ore or mineral before a claim could be filed, and the inspection was for the purpose of ascertaining whether the requirements of the law had been met, whether in truth a discovery had actually been made. The fact that a find had to be verified by an impartial and competent mining engineer appointed by the Government before being accepted as the basis of a claim proved a powerful stimulant to the making of bona fide discoveries of valuable mineral. The standard exacted by the inspectors was not unreasonably high. As subsequently crystallized in the definition of valuable mineral in the Mines Act, 1906, it required the presence of mineral or minerals sufficient in quantity and kind to make it probable that on development the deposit would prove to be a workable mine. It did not demand native silver, nor silver compounds, nor smaltite, nor niccolite, nor in fact any particular mineral or minerals; but it did demand that something tangible should have been found which warranted the expectation that the expenditure of further

labor would result in an actual mine, and justified the handing over into private hands of 40 acres of the public domain.

The combined effect of these conditions—the richness of the prizes and the requirements of the law—was such as to make it doubtful whether a larger amount of painstaking, persevering work in the way of prospecting was ever expended within a like area. Men dug and shovelled in the trenches all day and were succeeded by their mates who continued the work all night; ditches twenty feet in depth and of corresponding width were sunk to solid rock where the slate-conglomerate was known to exist; shafts of working size were put down 20, 30 or 40 feet in the solid rock following up a barren vein of calcite or in the hope that a crack the width of a knife-blade on the surface might increase in width and prove a bonanza in depth; diamond drills were called into requisition; and all this not to develop known deposits, but simply to find mineral in quantity and kind sufficient to satisfy the law and so show cause for title being given for the land.

The usual fantastic aids to prospecting in the shape of divining rods and similar appliances were not lacking, and in a camp where search for minerals had of necessity to be carried on to some extent blindly, were accepted by some, either out of credulity, or for lack of better guidance.

THE PRODUCING MINES

The producing mines of the Cobalt camp in 1905 were the following: La Rose Mining Company, on mining location J S 14; M. J. O'Brien, mining location R L 403; Kerr Lake Mining Company (Jacobs' mine) part of lot 3, concession four, Coleman township; Victoria Mining Company (Foster mine), the southeast quarter of north half lot 4, concession four, Coleman; Buffalo Mining Company (American mine) town-site of Cobalt; W. G. Trethewey, (Trethewey Silver-Cobalt Mining Company, or New Ontario mine), mining location J B 7; Trethewey and Leonard, (Coniagas mine), mining location J B 6; Cobalt and Silver Mining Company (McKinley-Darragh mine), mining location J B 1; Nipissing Mining Company, mining locations R L 404, R L 406, etc.; H. E. Lawson (Lawson mine), southwest quarter of north half of lot 3, concession four, Coleman; White Silver Company (Hargrave mine), part of lot 3, concession four, Coleman: The University Mining Company (University mine), south part of lot 4, concession four, Coleman; Watts and Allan (Watts mine), northeast part of north half lot 3, concession five, Coleman; Temiskaming and Hudson Bay Mining Company (now Cobalt Silver Queen), part of southeast quarter of north half of lot 7, concession five, Coleman; Violet Mining Company (Handy mine), northwest quarter of south half of lot 3, concession six, Coleman; Drummond Mines, Limited (Drummond mine), northeast part of north half of lot 2, concession four, Coleman—16 shipping mines in all. The number of distinct shafts or openings from which ore was raised was greater, as several locations—for instance, those owned by the Nipissing Mining Company, whose holdings are the most extensive of any company in the camp, aggregating in all 846 acres—are included in the area worked by a single concern or individual, and treated for statistical purposes as one mine.

In addition to the mines engaged in commercial production, a small quantity of ore was shipped from Mr. Philip Green's property, the southeast quarter of the north half of lot 14 in the first concession of Bucke, and a quantity of silver in the shape of nuggets sold by Messrs. Glendinning and McLeod from their claim situated in the southwest part of lot 3 in the sixth concession of Coleman.

The active prospecting carried on in the season of 1905 included the western and northern portions of the township of Lorrain, lying to the east of Coleman township, and the southern portion of the township of Bucke lying to the north, but the results were somewhat disappointing. The region within which the rich silver ores are found seems so far to be largely confined to the township of Coleman, and to certain belts of slate-conglomerate or breccia there, namely, those in the vicinity of Cobalt, Cross and

Kerr lakes respectively, together with local areas of Keewatin and diabase near by. Further exploration may reveal other highly argentiferous areas, but so far they have not been found.

Up to the present the occurrence of cobalt, nickel and arsenic in association with the silver of the Cobalt ores has not proven of great advantage to the mine-owners. The buyers of ore who at first were willing to pay 65 and 70 cents per pound for the cobalt contents, 12 and 15 cents per pound for the nickel, and 1 cent per pound for the arsenic, ceased during 1905 to pay anything whatever for these constituents. The main values being in the silver, the mines will continue to be worked and ore to be produced, notwithstanding that these subsidiary minerals have to be given away; but it is sincerely to be hoped that ere long a process may be devised and works established either on the spot or somewhere within the limits of the Province, which will by recovering all the valuable constituents of the ore, put an end to this deplorable waste and source of financial loss, that in many cases amounts to at least $100 per ton of ore, and in some instances to considerably more.

The problem of the economical treatment of their ores is now being carefully considered by some of the leading mine-owners, who in default of relief from any other quarter, propose to take the matter in hand themselves. The Canadian Copper Company is now engaged in constructing a refinery at Copper Cliff, in which it is understood that the ores from the Nipissing Mining Company's mines will be treated, either wholly or in part, and other works are talked of.

The demands for information respecting the Cobalt region made on the Bureau of Mines have been very extensive, and in order to meet it, a second edition of Prof. Miller's description of the region, being Part II of the Bureau's Fourteenth Report has this year (1906) been brought out. The edition is of 10,000 copies. The report has been in part re-written, and the geological map corrected and brought down to a later date. A review of the working properties by Mr. E. T. Corkill, Inspector of Mines, will be found in the present volume. Prof. Miller, the Provincial Geologist, and assistants are this year (1906) again to take the field for the purpose of reviewing and correcting the geology of the mineral area, and of bringing an account of the working mines and developments down to a somewhat late period of the year. It is hoped to publish this account, together with a more minute and detailed map of the region on a large scale and geologically colored, as part of the Sixteenth Report. Meantime, the Bureau is in a position to supply inquirers with the Report and map above referred to. That they have been of very great practical benefit in the examination and development of the district is amply vouched for by unsolicited testimony.

Particulars of the silver mining industry for the five years beginning with 1901 are given in the following table. For the years 1904 and 1905 the production has been wholly from the Cobalt field, except for small quantities extracted from the residues of the Copper Cliff nickel-copper mattes.

Table V.—Silver Mining, 1901 to 1905

Schedule.		1901	1902	1903	1904	1905
Ore raised	tons	11,000	6,250	3,400	158	3,144
Ore stamped	"	7,560	6,250	3,360	....	....
Ore shipped	"	....	....	....	158	2,144
Bullion product	oz.	151,400	96,666	16,688	206,875	2,473,452
Value of bullion	$	84,830	58,000	8,949	111,887	1,372,577
Men above ground	No.	30	25	12	29	289
Men under ground	"	35	25	20	28	186
Wages paid	$	29,500	36,000	8,000	12,300	191,582

Some interesting deductions may be drawn from the figures in the above table. In the first place, the quantity of ore raised and shipped during the year 1905 was small.

The total amount hoisted, 3,144 tons—and this from 16 mines—is not more than three or four days' work for say the great Creighton nickel mine, while the total shipments 2,144 tons, are about equal to two days' delivery from that mine.

But the ore made up in quality what it lacked in quantity. The average contents of the ore shipped out of the camp were 1,143 ounces of silver per ton, and the average value of the ore per ton for silver only was $635. The average value was perceptibly lowered by the shipment of some 352 tons of auriferous gravel from one of the mines on Cobalt lake, the debris from veins on the shore, which ran about 537 ounces per ton. Excluding these consignments, the average contents of the ore shipped from the veins in place was 1,262 ounces of silver, valued at about $700 per ton.

The number of men employed in the mines, 475 in all, is large in comparison with the quantity of ore handled, and works out at 6.6 tons of ore raised, and 4.5 tons of ore shipped per man. This is no doubt accounted for in part by the narrowness of the veins, which restricts the quantity of the ore, and in part by the fact that many, if not all of the mines were in the development stage, where much labor is necessarily in other work than actual mining.

On the other hand, out of every dollar received on account of ore shipped, only some 14 cents were paid out as wages for labor, leaving 86 cents for other expenses, replacement of capital and profit. The profitable nature of silver mining at Cobalt is apparent from this statement; and that no great amount of capital is necessary for the development of a bonanza vein is further evident from the fact that in several instances, the original prospectors who discovered the veins are still in possession of a controlling interest in their properties, and have without trouble realized sufficient money from the sale of ore to equip their mines with all needed machinery and plant The Trethewey, University, and Foster mines are examples of this.

The Subsidiary Products

As stated above, the mine owners of Cobalt were paid for the cobalt, nickel and arsenic contents of their ores during the early part of the year only; for the remainder of the twelve months they received nothing for these constituents. No assays, consequently, were made to show the proportions or quantities of these metals present in the consignments in which they were treated as valueless. The various mines differ considerably from one another in the percentages of cobalt, nickel and arsenic, but an attempt has been made with the imperfect data received to estimate the quantity and value of these elements shipped out of the district during the year. The result is as follows:

	Quantity. Tons.	Value. $
Cobalt	118	100,000
Nickel	75	10,000
Arsenic	549	2,693
Total		$112,693

This is on the basis of 5.5 per cent. of cobalt, 3.5 per cent. of nickel, and about 25 per cent. of arsenic. The value of these substances is arrived at by computing the several quantities at the prices paid in those cases where returns were received for them by the shippers. Adding the total to the silver value of the shipments, an aggregate is obtained of $1,485,570, being a gross average of $693 per ton a remarkably high figure.

The total production of the Cobalt mines to the end of 1905 has been as follows:

Table VI.—Production of Cobalt Mines, 1904-5

Year.	Ore shipped	Nickel.		Cobalt.		Arsenic		Silver.		Total Value.
	Tons.	Tons.	Value. $	Tons.	Value $	Tons	Value. $	Ounces.	Value. $	$
1904............	158	14	3,467	16	19,960	72	903	206,875	111,887	136,217
1905............	2,144	75	10,000	118	100,000	549	2,693	2,451,356	1,360,503	1,473,196
Totals	2,302	89	13 467	134	119 960	621	3,596	2,658 231	1,472,390	1,609,413

From this summary it appears that the average value of the ores shipped during the two years of the camp's existence has been $699 per ton, declining from $862 per ton for the few tons of rich ore shipped in 1904 to $687 per ton for the much larger output of 1905. The nickel contents averaged 3.8 per cent. by weight, cobalt 5.8 per cent., and arsenic 27 per cent. The value of the ores lies almost wholly in their silver, which brought in 92 per cent. of the returns, cobalt producing 7 per cent., while nickel yielded .8 per cent., and arsenic .2 per cent. only.

A Boom in Mining Stocks

It is to be regretted that the signs are too evident that the Cobalt mining district is to be the scene of another joint stock company "boom." The undoubted richness of the district is attracting to it not only those who wish to engage in legitimate mining, but also that class of speculators which descends upon every rich mining camp in order to turn to personal advantage the hopes of gain aroused in the public breast by the sight of the suddenly revealed mineral wealth. Their *modus operandi* is, of course, to form so-called "mining" companies and float their stock while the public's expectations are yet big and their hopes high. Too often these stocks are greedily bought by those quite unable to discriminate between good and bad, only with the object of selling them at an advance. The whole process is a species of gambling, and has no more relation to real mining than betting on a race track has to the raising of thoroughbred horses. The result is invariably disastrous. It might have been thought that the exploded booms of the past would have warned the Canadian public against the folly and danger of gambling in mining stocks; but evidently no one learns wisdom from the experience of others, and each few years sees another generation succeeding its predecessor quite as anxious to acquire wealth without working for it, and, therefore, quite as ready to fall into the snares spread by the unscrupulous promoters of bogus mining companies.

The effect on the mining industry, however, is bad. Nothing so hampers or prejudices real mining as a period of inflation in which worthless stocks are palmed off in quantities on a too-credulous public. The inevitable reaction sets in, and capital, fearful of further losses, cannot be coaxed into mining enterprises no matter how promising or attractive. Mining is regarded as little short of gambling, and the industry languishes until events restore a degree of confidence, and ocular demonstration is afforded that mining in many cases is a highly remunerative business.

Cobalt

The ores of cobalt raised in 1905 were wholly from the camp of that name, no production being reported from the mattes of the Sudbury district. The Bessemer process of converting the low-grade nickel-copper matte made in the blast furnaces at Copper Cliff and Victoria Mines is not favorable for the recovery of the compara-

tively small proportion of cobalt which these ores contain. The chief features of interest in connection with the production of cobalt have already been touched upon under the heading of silver.

It is a little curious that although cobalt occurs so abundantly in the veins of Coleman township, the fact that it is for the most part associated with silver, a more valuable mineral, constitutes an obstacle to its utilization. Cobalt refiners in England would willingly purchase supplies of cobalt ore, but they require it to be free from silver, and will not buy silver ore for the cobalt it contains. There are but few cobalt veins in the camp which do not carry silver as well. One of these is on Mining Location R L 404, owned by the Nipissing Mining Company, which was one of the four veins found in 1903, and is described by Prof. Miller in the Bureau's Thirteenth Report, 1904, p. 99. Another is known as the Benn mine, situated on the north part of lot 15 in the first concession of the township of Bucke. This was located by Ira L. Benn in the fall of 1904, and has since been purchased by Dr. C. K. Leith of Madison, Wis., and associates.

The Cobalt deposits have made the characteristic and unmistakable hue of cobalt "bloom" well-known to the prospectors of Ontario, and discoveries of this compound have been reported from other parts of the Province—for example, from Whiskey lake, in Algoma district north of the Sault branch of the Canadian Pacific railway, and from the vicinity of Madoc in the county of Hastings. The latter is not a new occurrence, as the mineral has for many years been known to exist in that locality, apparently, however, in small quantities. No deposits of the unchanged ore or smaltite are alleged in either of these places. In the western portion of the township of Coleman near Portage Bay, an arm of Bay lake, which is itself an expansion of the Montreal river, several small veins of smaltite have been found, which do not, however, appear to be accompanied by silver. In the township of Casey, Temiskaming district, some twelve or fourteen miles north of Coleman township, a good cobalt vein has been found, which is said to carry native silver. The discovery on Rabbit lake, Temagami Forest Reserve, has not improved on further development work being done. West of Bay lake, near Trout lake, Mr. Thos. A. Edison, of Orange, New Jersey, has purchased a location upon which cobalt was found and will develop it during the present season (1906). Mr. Edison, it is alleged, has perfected a new storage battery, in which cobalt is employed as one of the electrodes for generating the electric current, and will require considerable supplies of the metal for the manufacture of these batteries.

The total output of cobalt for 1905 is estimated at 118 tons, worth about $100,000.

Nickel and Copper

A very decided increase marked the output of nickel in 1905, as compared with that of 1904, or indeed of any previous year. In the latter year the production was 4,743 tons valued at $1,516,747, while in 1905 it was more than double the quantity, namely, 9,503 tons having a value of $3,354,934. The largest previous production was 6,998 tons in 1903.

The sole producers continue to be the Canadian Copper Company, whose remodelled and greatly improved plant at Copper Cliff was in full operation throughout the year, and the Mond Nickel Company, who resumed the smelting of ore at Victoria Mines early in the year. Both companies now bring their ores to a Bessemer matte, the former exporting their product for treatment at Constable Hook, New Jersey, and the latter to Clydach, Wales.

The Creighton mine, as in 1904, furnished the bulk of the ore treated by the Canadian Copper Company, but a considerable quantity was also raised by this company from its No. 2 mine at Copper Cliff, which was re-opened about the beginning of 1905.

The ore smelted by the Mond Nickel Company came almost entirely from Victoria No. 1 mine. A few tons of ore were raised by the Lake Superior Corporation from the Gertrude mine, but none was smelted.

Following are the quantities of ore raised during the year, and the mines from which they were taken:—

Canadian Copper Company:		
Creighton	186,061	tons
No. 2, Copper Cliff	38,940	"
Mond Nickel Company:		
Victoria No. 1	51,998	"
Victoria No. 2	267	"
Lake Superior Corporation:		
Gertrude	500	"
Total	277,766	"

The nickel mining of the Sudbury region remains the most important branch of the industry in Ontario, employing, as it does, more capital and labor, and turning out a product having a greater value than any other. The stage of development to which it has been brought, and the skilful manner in which it is conducted by the two companies above mentioned, reflects credit upon their courage, persistency and good management. They have given the nickel fields of Ontario an unquestioned supremacy in the world's production of this metal.

In the treatment of the Canadian Copper Company's mattes some 1,562 ounces of platinum metals were obtained during the year 1905, valued at $28,116. No separation was effected between the platinum and palladium thus produced.

The developments of the past year in the nickel mines are noted by Mr. Corkill, Inspector of Mines, in his report. A comprehensive account of the Sudbury Nickel Field by Dr. A. P. Coleman was printed as Part III of the Bureau's Fourteenth Report, 1905, along with a map of the entire field, geologically colored, exhibiting both the northern and southern ranges. There has been a good demand for this Report, but a number of copies remain on hand for distribution.

The copper district lying to the north of Lake Huron has not yet reached the point of development which its merits seem to warrant. There are many prospects, but comparatively few mines. One lack of the district is a copper smelter, which would afford a market for ore taken out in the course of development that cannot now be disposed of, owing to the heavy burden of transportation charges to copper smelters in Michigan or the Eastern States. A number of the veins discovered are of small size, but judging from surface outcroppings, there are many others of payable dimensions. The lodes in the old Bruce mines were large, and modern methods of treatment and present day prices for copper should bring about a revival of interest in this promising region. The Bruce mines were being unwatered about the close of the year, preparatory to mining being begun by the Copper Mining and Smelting Company of Ontario, an English concern, of which Mr. H. J. Carnegie-Williams is manager.

The producing mines during the year were Massey Station, Superior and Hermina, the total quantity of ore raised being 6,324 tons, the estimated contents of which were 143 tons of copper. The ore thus averaged about 2.3 per cent. copper.

In Table No. VII are given particulars of the nickel and copper production of the Province during the five years ending with 1905:

Table VII.—Nickel-Copper Mining 1901 to 1905

Schedule.		1901	1902	1903	1904	1905
Ore raised	tons	326,945	269,538	152,940	203,388	284,090
Ore smelted	"	270,380	233,388	220,937	102,844	257,745
Ordinary matte produced	"	29,588	24,691	30,416	19,123	....
High grade matte produced	"	15,546	13,332	14,419	6,926	(a) 17,588
Nickel contents	"	4,441	5,945	6,998	4,743	9,503
Copper contents	"	4,197	4,066	4,005	2,163	4,525
Value of Nickel	$	1,859,970	2,210,961	2,499,068	1,516,747	3,354,934
Value of Copper	"	589,080	616,763	583,646	297,126	688,993
Wages paid	"	1,045,889	835,050	746,147	570,901	833,822
Men employed	No.	2,284	1,445	1,277	1,063	1,176

(a) Bessemer.

In addition to the foregoing statistics, it may be stated that 47,979 tons of coke were used in smelting the nickel-copper ores of the Sudbury region, valued at $319,535, and 23,745 cords of wood consumed as fuel, mainly for roasting the green ore for the expulsion of the sulphur.

The average proportion of nickel contained in the ore smelted in 1905, as deduced from the contents of the Bessemer matte produced, was less than in that smelted in 1904, dropping from 4.58 to 3.7 per cent.—a fall probably due to the smaller proportion of Creighton ore used in 1905 as compared with 1904. The copper contents of the ore smelted last year, similarly calculated, were 1.75 per cent., as compared with 1.86 per cent. in 1904.

Water Powers in Northern Ontario

The water power developments noticed in last year's Report as being under way in the nickel region have since then been completed. These are three in number: The plant of the Huronian Company at High Falls on the Spanish river; the works of the Sudbury Power Company at McPherson's Falls on the Vermilion river in the township of Creighton; and the plant installed by the Wahnapitae Power Company at Dryden Falls on the Wahnapitae river. The combined capacity of these plants is about 24,000 horse power, of which less than half is at present developed. The power from the High Falls of the Spanish is transmitted to the Canadian Copper Company's mines and works at Copper Cliff, 30 miles away, where electricity is replacing steam in the operation of machinery. The substitution of power generated by the falling of water for that produced by the combustion of fuel, whether wood or coal, will allow a very considerable saving of costs in many branches of the mining industry, as well as contribute not a little towards the industrial development of the region in other lines.

In other parts of northern and western Ontario the question of utilizing some of the numerous water powers found on the large rivers and at the outlets of lakes is receiving practical attention. At High Falls on the Michipicoten river, a syndicate from Berlin, Waterloo county, is installing a plant to provide cheap power for use of the low-grade gold mines of the region. The Kaministiquia Power Company is actively engaged in putting in important works at Kakabeka falls on the Kaministiquia river, and purpose supplying Fort William and Port Arthur with whatever power these places may require. The latter town has a municipally owned and managed water power on the Current river. The Spanish river at Webbwood falls, near the town of that name, has been harnessed by the Spanish River Pulp and Paper Company for the operation of a pulp mill on the spot. The falls of the Sturgeon river at Sturgeon Falls have for several years been producing power for purposes of the pulp and paper mill at that place, now owned and operated by the

Imperial Paper Mills, Limited. On the east branch of the Winnipeg river where it emerges from Lake of the Woods, the town of Kenora has had a small power plant under operation for some time, and is taking steps to materially enlarge it. At the town of Dryden in Rainy River district, the falls of the Wabigoon are to be brought into requisition for the operation of a pulp and paper mill. The falls of the Rainy river at Fort Frances are being developed by the Backus syndicate to provide power for pulp mills and other industries. The magnificent works of the Lake Superior Corporation by which the difference in level between Lakes Superior and Huron are utilized in the production of power, are well known. In the Temiskaming region, the falls of the Blanche river at the foot of Long lake have been improved for saw-mill and similar purposes, and other falls lower down the same stream are also to be developed. There are several fine powers on the Montreal river, some of which might without great difficulty be made to contribute to the power requirements of the Cobalt mining region, not many miles away, where already the mine owners are beginning to experience difficulty in procuring sufficient supplies of wood suitable for fuel.

Coming to older Ontario, the town of Bracebridge has for years been drawing energy for lighting and other uses from falls on the Muskoka river within the limits of the municipality, while Orillia has been doing likewise from Ragged Rapids on the Severn river about eighteen miles away. In the eastern part of the Province, a fall on the Madawaska river is employed in producing power for operating the Black Donald graphite mine in Brougham township, Renfrew county, and a water power at the outlet of Deer lake was a few years ago improved to furnish energy for the purposes of the Belmont gold mine at Cordova, Peterborough county.

The foregoing list enumerates only a few of the many fine water powers in the newer regions of the Province. The others are running to waste. It is certain that the part to be played by water power in the industrial development of the Province will be a very important one. Nowhere will it be more important than in the great Clay Belt north of the height of land, where the new Province now taking form contains many magnificent streams longer and more important than their compeers draining into the great lakes, but marked like them by numerous rapids, falls and cascades.

Iron Ores

There were raised from the iron mines of the Province in 1905 211,597 tons of ore, valued at $227,909, as against 53,253 tons worth $108,068 in 1904. The increase was due to the fact that the Helen mine, Michipicoten district, which was in operation for part of 1904 only, was working during the whole of last year. Of the quantity produced, 204,487 tons were hematite, and 7,110 tons magnetite.

Iron ore was produced at the Helen mine, and at the Breitung and Williams properties, near Sault Ste. Marie; these are all hematite mines. Magnetite was raised from the Radnor mine, near Eganville, Renfrew county, owned by the Canada Iron Furnace Company.

The production of iron ore during the last nine years was as follows:—

Year.	Quantity.	Value.
	Tons.	$
1897	2,770	4,996
1898	27,409	48,875
1899	16,911	30,951
1900	90,302	111,805
1901	273,538	174,428
1902	359,288	518,445
1903	208,154	450,099
1904	53,253	108,068
1905	211,597	227,909
Total	1,243,222	1,675,566

The quantity of iron ore extracted from the mines of the Province, as nearly as can be now ascertained, from 1869 to 1896, inclusive, was 582,542 tons, valued at $1,445,228; consequently the total output from 1869 down to the end of 1905 was 1,825,764 tons, having a value of $3,120,794. A glance at the figures given above shows that the production began to increase in the year 1900—the date of the first shipments from the Helen iron mine. It fell off in 1903 and 1904, during parts of which years the Helen mine was closed for the most of the time owing to the financial difficulties of its owners. In the six years the Helen mine has been worked, as shown in the above table, it has raised and shipped upwards of 1,100,000 tons of ore.

Exploring for iron ores goes on steadily from year to year. In addition to the iron ranges or fields mentioned in former Reports, there is reason to believe that ore bodies of importance will be found west of the township of Hutton, probably continuations of the deposits in the latter place, for which a branch of the Canadian Northern railway will shortly afford an outlet; also at Woman river, north of the main line of the Canadian Pacific railway. Iron ranges have also been located near Burwash[1] lake and Shining Tree[2] lake in the Temagami Forest Reserve, but the amount of development work done at these points is insufficient to prove the value or character of the deposits. Prospecting work done in the vicinity of the banded magnetite deposits on the northeast arm of Lake Temagami are said to have revealed the presence of hematite, but the extent of the bodies has not yet been shown. Samples of hematite of good quality have also been brought from the neighbourhood of Flat Rock rapids, on the Montreal river.

In view of the importance of obtaining all authentic information possible regarding the iron ore resources of the Province, it is proposed to undertake an examination of the iron ore ranges lying east of Lake Nepigon, which have frequently been referred to in the Bureau's Reports, and a visit to which in 1900 forms the subject of a brief note by Mr. J. W. Bain in the Tenth Report, pages 212 to 214. The investigation will probably be undertaken by Dr. A. P. Coleman, and in view of the large area which it will be necessary to examine, may extend over two or three years.

In the present volume are published the results of Dr. Coleman's examination of the iron ranges of eastern Michipicoten, in which he was assisted by Mr. E. S. Moore. This work was in continuation of previous explorations in the Michipicoten region by Dr. Coleman[3] himself, by Prof. A. B. Willmott,[4] and also by Mr. James M. Bell.[5]

Pig Iron and Steel

The production of pig iron in the blast furnaces of Ontario, situated at Hamilton Deseronto, Midland and Sault Ste. Marie, during 1905 amounted to 256,704 tons, valued at $3,909,527, being more than double, both in quantity and value, of the previous year's output, which was 127,845 tons, worth $1,811,664.

To produce the above quantity of pig iron, 61,960 tons of domestic and 383,459 tons of imported ore were required.

Of the pig iron produced by the Hamilton Steel and Iron Company and the Lake Superior Corporation, a sufficient quantity was converted into steel by those companies to make 138,387 tons of steel, worth $3 321,884.

Details of the operation and products of the blast furnaces and steel works are as follows:

Ontario ore smelted,	tons	61,960
Foreign " "	"	383,459
Scale and mill cinder	"	23,280
Limestone for flux,	"	121,052
Coke for fuel,	"	262,415

[1] Bur. Mines. 6th Rep. 1896, p. 170. [2] Ibid., p. 174.
[3] Bur. Mines, 8th Rep. 1899, pp, 254-258; 9th Rep. 1900, p 154 *et seq*; 10th Rep. 1900, p. 191 *et seq.*; 11th Rep. 1901 p. 152 *et seq.*; [4] Ibid; [5] Bur. Mines, 14th Rep. 1905, p. 278 *et seq.*

Value of fuel	$	1,250,816
Charcoal for fuel	bush	3,387,869
Value of fuel	$	135,515
Pig iron product	tons	256,704
Value of product	$	3,909,527
Steel product	tons	138,387
Value of product	$	3,321,884
Workmen employed	No.	1 684
Wages paid	$	1,131,078

Statistics of the iron and steel-making industry for the five years ending with 1905 are given in the following table:—

Table VIII.—Production Iron and Steel, 1901 to 1905

Schedule		1901	1902	1903	1904	1905	Total.
Ontario ore smelted	tons.	109,109	92 883	48,092	50,423	61,960	362,467
Foreign ore smelted	"	85,401	94,079	103,137	173,182	383,459	839,258
Limestone for flux	"	51,452	58,885	49,426	61,566	121,052	342,381
Coke	"	113,119	111,390	96,540	135,108	262,415	718,572
Charcoal	bush	915,789	968,623	932,631	1,821,270	3,387,869	8,026,181
Pig iron	tons	116,370	112,687	87,004	127,845	256,704	700,610
Value of pig iron	$	1,701,703	1,683,051	1,491,696	1,811,664	3,909,527	10,597,641
Steel	tons.	14,471	68,802	15,229	51,002	138,387	287,891
Value of steel	$	347,280	1,610,031	304,580	1,188,349	3,321,884	6,772,144

Lead

The only mine raising lead ore in 1905 was that of the Ontario Mining and Smelting Company at Bannockburn, Hastings county. A sufficient quantity of ore was mined to yield, together with some material from the dump, some 172 tons of concentrates containing an average of 82 per cent. lead.

Building Materials

Taking up the products included in the non-metallic group, it is convenient first to deal with Building or Construction Materials, comprising under this head Stone, Lime, Brick and Cement.

STONE

Returns made to the Bureau indicate clearly that the building trade during 1905 was in an active condition throughout the Province. Stone, both for construction purposes, and in the crushed state for road material, had an output of some $700,000 in value. As the figures in the table indicate, the large proportion of this sum represents the cost of labor expended in quarrying and preparing the stone for market. Some interest has been shown in the building stone resources of the county of Hastings in the vicinity of Bancroft, where there are extensive beds of granite or gneiss, dolomitic limestone or marble of varying texture and color, and also deposits of sodalite, whose deep blue tint makes it suitable material for inside decorative work. It appears likely that an effort will shortly be made to place these products on the market both in the cities of Ontario and those south of the boundary line within reach of transportation, where there exists a large and steady demand for articles of the kind. An extension or spur of the Central Ontario railway may be built in order to afford the necessary outlet.

Attention may here be drawn to the full account of the Limestones of Ontario by Prof. Miller, Provincial Geologist, published as Part II. of the Bureau's Thirteenth Report, 1904. A number of copies of this Report remain on hand for distribution.

LIME

The lime kilns of the Province last year turned out in the neighbourhood of 3,100,000 bushels of lime, as compared with 2,600,000 bushels in 1904. There is abun-

dance of limestone throughout older Ontario, and although it varies greatly in composition, not only because of differing geological age but also through local conditions, it is a fortunate circumstance that its usefulness for conversion into lime for building is not materially affected by these variations. Experience for many years in Ontario seems to show conclusively that the prejudice against magnesian limestone for lime-burning purposes, existing in some parts of the world, is not well founded.

BRICK

The brickyards of Ontario were busy during 1905, and turned out a considerably increased output as compared with the previous year, the production being 250,000,000 common and 26,000,000 pressed, as against 200,000,000 common and 26,857,000 pressed a year ago. The value, too, went up considerably, averaging $7.75 per thousand as against $7.15 in 1904. The increase in the cost of labor, fuel, and manufacture generally within the last few years shows plainly in the price of brick, an article whose cost depends so little upon the value of the raw material, and so much upon the labor, fuel and plant required to produce it. This steady advance is shown by the following figures for the average price per thousand of common bricks produced in Ontario, as reported to the Bureau from year to year:—

Year.	Price per M.
1900	$5 90
1901	5 73
1902	6 41
1903	6 78
1904	7 15
1905	7 75

Part II. of this Report on Clay and the Clay Industry of Ontario, by Prof. M. B. Baker, of the Kingston School of Mining, will be appreciated by all who are interested in this most important branch of the mineral industry of the Province. Mr. Baker's investigations of the clays and shales of Ontario are probably the most systematic and extensive that have been made from the economic point of view since the days of the early Canadian geologists, and some of the facts and generalizations appearing in the Report afford new views of some departments of the subject.

Other clay products are drain tile, paving brick, sewer pipe and pottery, the output of all of which was nearly normal for the year. The manufacture of the last-named, however, can hardly be said to have obtained more than a foothold as yet in Ontario. Only the coarsest and cheapest goods are made of the native clays; all the finer articles of domestic production are made from imported material.

CEMENT

The manufacture of Portland cement grows apace, the output of Ontario factories for 1905 being greater than for any preceding year, and an advance over that of 1904 by 42 per cent. in quantity and 44 per cent. in value.

The producing plants numbered eleven, as follows: The Grey and Bruce Cement Company, Brookholm; The Owen Sound Portland Cement Company, Shallow Lake; The Sun Portland Cement Company, Owen Sound; The Imperial Cement Company, Owen Sound; The Canadian Portland Cement Company, Strathcona and Marlbank; The National Portland Cement Company, Durham; The Ontario Portland Cement Company, Blue Lake; Belleville Portland Cement Company, Point Ann; Lakefield Portland Cement Company, Lakefield; Raven Lake Portland Cement Company, Raven Lake; Hanover Portland Cement Company, Hanover.

Three plants, those of the Western Ontario Portland Cement Company at Atwood, the Colonial Portland Cement Company, near Wiarton, and the Superior Portland

Cement Company, at Orangeville, were in course of construction and equipment, but had not turned out any cement up to the close of 1905.

Natural rock cement does not seem to be growing in favour, judging from the lessening output from year to year. Three factories, those of Mr. F. W. Schwendiman, Rymal; the Toronto Lime Company, Limehouse, and Mr. Isaac Usher, St. David's, produced 14,741 barrels, valued at $10,402, a decided falling off from 1904, when 85,000 barrels were made worth $65,250.

The average selling price of Portland cement at the factories was $1.42 per barrel, an increase of two cents per barrel over the price obtained in 1904; that of natural rock cement was 70 cents, a reduction of seven cents as compared with 1904. The number of workmen employed in the Portland cement plants was 935, and the amount of wages paid out $498,052; in the natural rock plants 33, who were paid wages to the extent of $4,453: the cement industry, as a whole, therefore, employed 968 workmen and paid out wages aggregating $502,505.

The steady and rapid expansion of the Portland cement industry in this Province can be traced very plainly from the following table:—

Table IX.—Production of Cement, 1891 to 1905

Year	Natural Rock.		Portland		Total	
	Bbl.	Value $	Bbl.	Value $	Bbl.	Value $
1891	46,178	39,419	2,033	5,082	48,211	44,501
1892	54,155	38,580	20,247	47,417	74,402	85,997
1893	71,353	63,567	31,924	63,848	106,277	127,415
1894	55,323	48,774	30,580	61,060	85,903	109,834
1895	55,219	45,145	58,699	114,332	113,918	159,477
1896	60,705	44,100	77,760	188,230	138,465	182,330
1897	84,670	76,123	96,825	170,302	181,495	246,425
1898	91,528	74,222	153,348	302,096	244,876	376,318
1899	139 487	117,039	222,550	444,228	362,037	561,266
1900	125,428	99,994	306,726	598,021	432,154	698,015
1901	138,628	107,625	350,660	563,255	489,288	670,880
1902	77,300	50,795	522,899	916,221	609,199	967,016
1903	89,549	69,319	695,260	1,182,799	784,809	1,252,118
1904	85,000	65,250	880,871	1,239,971	965,871	1,305,221
1905	14,741	10,402	1,254,360	1,783,451	1,269,101	1,793,853
Total	1,199,264	950,354	4,704,742	7,630,312	5,897,006	8,580,666

The remarkable development of the Portland cement manufacture in this Province shows that the conditions here for the industry are favorable, and that the demand for the product is increasing from year to year. That the increase in production has been in almost geometrical ratio for a number of years, and that it has been made in face of a pronounced tendency towards lower prices, may be seen from the following figures:

Year.	Increase over previous year.	Average price per bbl.
	Per cent.	$
1899	45	1.99
1900	38	1.94
1901	14	1.60
1902	49	1.75
1903	33	1.70
1904	27	1.40
1905	42	1.42

The Bureau's Fourteenth Annual Report, Part I, published last year, contained a full account of the Cement Industry of Ontario, by Mr. P. Gillespie, B.Sc Tables

were given showing the results of tests made by the writer of the paper on the product of the several cement plants of the Province. It was asserted by the Lakefield Portland Cement Company that these tests did not do complete justice to their brand of cement, known as the "Monarch." Mr. Gillespie was accordingly asked to make another examination of the Lakefield Company's product. He did so, and reported as follows:

"Results of tests on a sample of 'Monarch' Portland cement supplied by the Lakefield Portland Cement Company in April, 1906:

Neat Cement.—3 days, 475 lb., 500 lb.; 7 days, 620 lb., 625 lb.; 28 days, 620 lb., 665 lb.

Three to One Mortar.—(Note.—The sand used for these briquettes was that prepared by the Sandusky Portland Cement Company, and is recommended by the American Society for Testing Materials. It is a natural sand, not crushed quartz). 7 days, 170 lb., 180 lb.; 28 days, 255 lb., 275 lb.

Fineness.—Residue on No. 50 sieve, 0.0 per cent.; on No. 100 do., 1.9 per cent.

Hot Test.—Pats were allowed to set in air for 18 hours, after which they were exposed to steam in a loosely closed vessel for four hours. The result was satisfactory."

Corundum

The production of grain corundum in the counties of Renfrew and Hastings continues to make progress, though difficulties are not wanting. The business is confined to two companies—The Canada Corundum Company, whose mines and works are at Craigmont in the township of Raglan, Renfrew county, and the Ashland Emery and Corundum Company, whose plant is at New Carlow, in the township of Carlow, Hastings county. The latter is the successor of the Ontario Corundum Company.

The first output of corundum was in 1900, when 60 tons were turned out, having a value of $6,000. Last year there were produced 1,681 tons of grain corundum, worth $152,464.

The development of the corundum industry is shown by the following table:

Table X.—Production of Corundum, 1901 to 1905

Schedule.	1901.	1902.	1903.	1904	1905.
Corundum produced .....tons	534	1,137	1,119	1,665	1,681
Value of product..... $	53,115	83,871	87,600	150,645	152,464
Workmen.....No.	68	95	186	202	216
Wages paid..... $	30,406	34,674	106,332	139,548	109,125

Feldspar

Steady, if not very rapid, growth is being made in the quarrying of feldspar at points along the line of the Kingston and Pembroke railway, the product being shipped to New Jersey and Ohio factories for making enamelled ware, etc. The spar is mineralogically a microcline, and contains a considerable proportion of potash. One of the problems which might engage the attention of the chemists of this country is the discovery of a feasible method of making use of the potash in this variety of feldspar for fertilizing purposes. The quarries of Bedford township and vicinity would afford an inexhaustible supply.

The producers in 1905 were Messrs. J. Richardson and Sons, Kingston, and Mr. Charles Jenkins, Petrolea. The quarries are in the township of Bedford, Frontenac county.

Figures for the feldspar industry during the past five years are as follows:

Table XI.—Production of Feldspar, 1901 to 1905

Year	Quantity.	Value
	Tons.	$
1901	5,100	6,375
1902	8,776	12,875
1903	15,296	20,046
1904	10,983	21,966
1905	12,234	29,968
Total	52,389	$91,230

The number of workmen employed in the quarries last year was 52, and the amount paid out in wages $19,200.

Iron Pyrites

The production of iron pyrites was smaller in 1905 than in the previous year, amounting to 7,325 tons, valued at $21,885, as compared with 13,431 tons in 1904, worth $43,716.

The production was mainly by the American Madoc Mining Company, whose mines are situated, one in the township of Hungerford about five miles east of Tweed, and one near Madoc. A small amount was also raised by the British America Mining Company of Toronto from a deposit near Queensboro.

The number of workmen employed in extracting the above quantity of mineral was 68, who were paid wages amounting to $27,690.

The growing use of pyrite instead of sulphur in the manufacture of sulphuric acid gives an increased importance to the pyrite deposits of Ontario, which occur not only in the eastern, but also in the northern and northwestern portions of the Province. Several properties are undergoing development at the present time, from which no shipments have yet been made. One of these is situated on mining locations W D 404 and 405, at James lake in the Temagami Forest Reserve, where Major R. G. Leckie has located and is opening up what appears to be a promising and workable body of ore. Another is near lake Minnietakie, near the projected line of the Grand Trunk Pacific, in which Mr. E. L. Michie of New York and his associates are interested. At the Helen iron mine, as is well known, a remarkable body of iron pyrites exists enclosed by, but quite separate from, the iron ore, doubtless representing a remnant of the original material from which the iron ore was derived, but which by some means escaped the metamorphic processes.

In order to disclose the potential wealth of the Province in this useful material—considerably more valuable, ton for ton, than iron ore—the Bureau has undertaken an investigation of the known deposits in all parts of Ontario where transportation facilities exist, or to which they are likely to be extended in the near future. This work has been entrusted to Mr. E. L. Fraleck, M.E., who is a recognized expert in iron pyrites. It is hoped Mr. Fraleck's report may be published in the Bureau's annual volume for 1907

The following schedule gives the annual and total production of iron pyrites during the last five years:

Table XII.—Production of Iron Pyrites, 1901 to 1905

Year.	Quantity.	Value
	Tons	$
1901	7,000	17,500
1902	4,371	14,993
1903	7,469	21,693
1904	13,451	43,716
1905	7,325	21,885
Total	39,616	$119,787

Mica

The output of the mica mines of the Province in 1905 was returned to the Bureau as 315 tons, worth in the rough-cobbed condition some $50,446. There were 104 hands employed in the business, earning in wages $27,320. The General Electric Company, Sydenham, was the chief producer.

Salt

The brine wells of Ontario yielded a total of 60,415 tons of salt during the year, an increase of 4,538 tons over 1904, but worth, according to the makers' returns, about $5,838 less. The industry employed 148 hands, and paid out in wages $68,580.

The Canadian Salt Company, Windsor, now produces the bulk of the salt made in Ontario: other operating companies are the Exeter Salt Company, Exeter; North American Chemical Company, Goderich and Clinton: Messrs. Gray, Young and Sparling, Wingham; the Sarnia Salt Company, Sarnia: Ontario People's Salt and Soda Company, Kincardine; and Parkhill Salt Company, Parkhill.

Table XIII exhibits the course of the salt industry for the past five years:

Table XIII.—Production of Salt, 1901 to 1905

Schedule.	1901.	1902.	1903.	1904.	1905.	Total.
Salt produced ... tons	60,327	62,011	58,274	55,877	60,415	296,904
Value of product ... $	323,058	344,620	388,097	362,621	356,783	1,775,179
Workmen employed ... No.	189	198	208	183	148	....
Wages paid ... $	67,024	76,154	87,995	84,682	68,580	384,435

Petroleum

The production of crude petroleum rose from 17,237,220 imperial gallons in 1904 to 22,131,658 imperial gallons in 1905, the largest output since 1900. It would thus appear that the united effect of the opening up of new pools in the old oil fields or their vicinity and the bounty paid of one and one-half cents per imperial gallon, which has been paid by the Dominion Government since 8th June, 1904, on domestic crude oil has for the present overcome the tendency towards a decline in output which for many years previous characterized the old fields of the southwestern peninsula. Boring for oil has been active in the Leamington field, and also in Tilbury township. A number of logs were given in the Bureau's last Report,[6] and further details are supplied in this volume by Mr. Eugene Coste, M.E., the well-known authority on oil and gas in Ontario.

The figures of production as given here are supplied by kindness of the Department of Trade and Commerce, Ottawa, and as they represent the quantity of crude

[6] Bur. Mines, 14th Rep., 1905, pp. 89-117.

oil upon which the bounty of 1¼ cents per gallon was claimed during the calendar year, they may be taken as correct. The amount of bounty paid was $331,974.86.

At the two refineries, those of the Imperial Oil Company at Sarnia, and the Canadian Refining Company at Petrolea, there were distilled during the year 33,821,998 imperial gallons of crude oil, valued at $1,333,411. Of this 22,244,872 gallons was the product of Canadian wells, and 11,577,126 gallons was imported from the United States, chiefly from Ohio, there being now no duty on imported crude. The domestic article therefore sufficed for only 66 per cent. of the requirements for refining purposes, the remainder, or 34 per cent., being met by the importations.

The following schedule gives the quantities and value of the products of the petroleum refineries for the year. In considering these figures, the facts mentioned above as to the origin of the crude article should be borne in mind. The various products may be credited to Canadian and American crude in the proportions respectively which these furnished of the total quantity distilled.

Schedule		Quantity.	Value.
			$
Illuminating oil	Imp. gal.	16,433,588	1,186,137
Lubricating oil	"	3,402,977	332,904
Benzine and naphtha	"	2,827,971	274,637
Gas and fuel oils and tar	"	5,788,351	203,257
Paraffin wax and candles	lbs.	4,077,610	199,743
Total value			$2,196,678

Table XIV gives a comparative statement of the quantity of crude oil produced and distilled during the past five years, and the quantities and values of the various products, etc.

Table XIV.—Petroleum and Petroleum Products, 1901-5

Schedule.		1901.	1902.	1903.	1904.	1905.	Total.
Crude produced	Imp. gal.	21,433,500	18,185,592	16,640,338	17,237,220	22,131,658	95,628,308
Crude distilled	"	17,745,182	15,630,592	14,464,248	22,805,109	33,821,998	104,467,129
Value crude produced	$	980,222	940,104	1,024,597	904,437	898,545	4,747,905
Value distilled products	"	1,305,540	1,298,961	1,451,756	1,670,805	2,196,678	7,923,740
Illuminating oil	Imp. gal.	9,463,262	7,720,866	7,096,073	11,461,435	16,433,588	52,175,224
Lubricating oil	"	764,861	2,765 677	2,614,313	2,683,281	3,402,977	12,231,109
Benzine and naphtha	"	1,075,999	902,847	832,153	1,488,503	2 827,971	11,568,921
Gas and fuel oils and tar	"	2,652,987	2,157,039	1,968,172	1,962,752	5,788,351	14,529,301
Paraffin wax and candles	lb.	3,489,492	2,433,127	2,673,806	2,272,511	4,077,610	14,946,546
Workmen employed	No.	351	323	291	406	469	....
Wages paid	$	161,042	169,398	165,700	229,955	280,701	1,006,796

The price of Canadian crude oil varied during the year from $1.26 to $1.34 per barrel, the market closing at the latter price on 31st December, 1905.

The value of the crude oil in the statistics here given does not include the Government bounty, which is equivalent to 52½ cents per barrel of 35 gallons.

Natural Gas

The natural gas product again showed a decided gain over the previous year, the aggregate value for 1905 being $316,476, as compared with $253,524 for 1904, and $196,535 for 1903. As in recent years, the gas field of Welland county supplied much the larger proportion of the output, but the Haldimand county field now yields an appreciable quantity, and even Essex county, where natural gas was a short time ago thought to be a thing of the past, again appeared as a producer, the wells of the Leamington Oil Company of Detroit, situated in the township of Mersea, furnishing a considerable supply for the use of the inhabitants of Leamington. Natural gas is

supplied to the people of that town at the following rates: Cook stove, per month. $2; house or office heater, $3; house furnace, $5; store heater, $3.50 or $5; store furnace, $6; or through the metre at 30 cents per thousand cubic feet. The municipality of Leamington formerly owned its own gas wells and supplied the people with gas as a municipal undertaking, but the supply failed. Now, the Leamington Oil Company supplies the gas through the town's mains, the gross receipts being divided equally between the company and the corporation, the latter defraying the cost of collecting the rates and attending to the distribution.

Gas is now piped from the Haldimand field to the following places: Dunnville, Dundas, Hamilton, Brantford, St. George, Galt, Jarvis, Attercliffe and Paris. It is sold both to distributing companies and to consumers direct, the price varying from 15 to 45 cents per thousand cubic feet, dependent upon the quantity used and whether for light or fuel. The field in this county is situated chiefly in the townships of Moulton and Walpole, and the gas comes from the Clinton and Medina formations at depths varying from 550 to 1,100 feet. The rock pressures run from 150 to 600 lb.

Considerable quantities of gas are used in the burning of lime by the Empire Limestone Company at Sherkston, and the Welland County Lime Works at Port Colborne. In the Welland field, however, the Provincial Natural Gas and Fuel Company continue to produce much the larger quantity, which is chiefly marketed in Buffalo, but also to some extent on the Ontario side of the boundary line.

The total number of producing wells in 1905 was 273; the number of producing wells bored during the year was 58, and of non-producing wells 5; 461¾ miles of pipe were in use for distributing the gas; 130 workmen were employed in the industry; and $88,865 paid in wages.

The fluctuations in the value, and consequently in the quantity, of natural gas produced in Ontario during the past five years is shown by the following figures:

Year.	Value.
	$
1901	342,183
1902	199,238
1903	196,535
1904	253,524
1905	316,476
Total	$1,307,956

Other Products

A quantity of arsenic, estimated at 549 tons, was contained in the shipments of ore from Cobalt. This mineral occurs as a constituent of the smaltite and niccolite which form by weight the bulk of the ore in the veins of that camp. There was no production from the mispickel deposits of Deloro and elsewhere in the county of Hastings, or of Net lake in the Temagami Forest Reserve. A mill and concentrating plant were installed at the Big Dan mine, Net lake, but the success of the process has not yet been determined. Other promising mispickel locations in the same neighborhood are being developed by Major R. G. Leckie.

The output of calcium carbide from the factories at Merritton and Ottawa last year amounted to 2,427 tons valued at $156,755, practically the same production as in 1904. The two plants employed 80 men, and paid out $35,600 in wages.

Two graphite properties were operated during 1905, the Black Donald mine on Whitefish lake, Renfrew county, and the deposit near Port Elmsley, Lanark county, owned by the Globe Refining Company. Mr. Rinaldo McConnell controls both of these properties. Some 2,078 tons of ore were raised from the two, from which 152 tons of refined products were obtained, valued at $9,825. Some 46 workmen were employed at the mines and works, who were paid $13,375 in wages.

Two gypsum deposits, both on the banks of the Grand river, were operated during the year, the output amounting to 2,353 tons in the crude condition, valued at $4,118. The Alabastine Company's works at Paris turns out a variety of products of which gypsum is the sole or leading constituent, the aggregate value of which was $23,833.

The problems involved in the manufacture of a satisfactory and economical fuel from the raw material contained in the peat bogs of Ontario have not yet wholly yielded to the persevering ingenuity which has been brought to bear upon them. One plant only was in commercial operation in 1905, that owned by Mr. Alexander Dobson of Beaverton, the output of which was 400 tons of compressed fuel, valued at $1,200.

One talc mine on lot 14 in the fourteenth concession of the township of Huntingdon, Hastings county, yielded some 1,120 tons of talc, valued at the mine at $2,240.

Mining Revenue

The following statement shows the Crown lands sold and leased for mining purposes during the year 1905:

Table XV.—Crown Lands sold and leased, 1905

District.	Sales.			Leases.			Amount.		
	No	Ac.	Amt. $	No.	Ac.	Amt. $	No.	Ac.	Amt. $
Rainy River..........	15	2,111	3,038	17	1,542	1,542	32	3,653	4,580
Thunder Bay.....	3	96	807	11	2,156	2,156	14	2,252	2,963
Algoma..........	2	187	604	29	4,775	4,095	31	4,962	4,699
Elsewhere	19	750	2,941	73	11,441	10,132	92	12,191	13,073
Total	39	3,144	7,390	130	19,914	17,925	169	23,058	25,315

On mining leases issued previous to 1905, rental was collected amounting to $21,622; and for miners' and prospectors' licenses there was received the sum of $14,623.

The gross revenue on account of mining, therefore, was as follows:

Sales and leases of land, 1905	$25,315
Rental lands previously leased	21,622
Miners' and prospectors' licenses	14,623
Total	$61,560

A very considerable number of mining leases having been suffered by the lessees to fall into arrear for rental, for periods ranging from one year up to six and upwards, notice was given by advertisement in a number of newspapers of the Department's intention to cancel all leases in default for one year or more. A proportion of the delinquent lessees paid up the amounts owing by them, but many more failed to do so. The proper steps were accordingly taken to cancel those leases on which the rental remained unpaid, and some hundreds were voided before the close of the year, the process being continued during the opening months of 1906. The properties thus abandoned, by virtue of the provisions of the Mines Act 1897 reverted to the Crown and became open for disposal to other parties for mining purposes.

Most of these surrendered lands consisted of mining locations in the Lake of the Woods and Seine river regions taken up during the excitement which followed the finding of gold in those districts a number of years ago. For the most part, not only were the leases in arrear for rental, but the holders had done little or nothing towards developing the lands. The public interest seemed to require that these lands, amounting in the aggregate to not less than some 300,000 acres, should not be permitted to remain tied up in the hands of persons who were unwilling either to work them or pay the small yearly rental accruing due.

Mining Companies

In the following schedule are given particulars of (1) the joint stock companies incorporated for mining purposes, or for the purpose of manufacturing mineral products, under the laws of Ontario, and (2) companies of foreign incorporation licensed by the Lieutenant-Governor in Council to do business in this Province. The number of (1) was 99, with an aggregate authorized capital of $27,509,000, and of (2) 17, with a united capital of $6,190,000; total number of companies 116, and total capitalization $33,699,000.

Table XVI.—Mining Companies Incorporated, 1905

Name of Company.	Date.	Head Office.	Capital.
			$
Aberdeen Brick Works, Limited	February 3, 1905	Hamilton	50,000
Blackford Oil and Gas Company, Limited	May 12, 1905	Windsor	30,000
Boileau Reduction Company, Limited	February 10, 1905	Toronto	1,200,000
Bonanza Creek Gold Mining Company, Limited	December 23, 1904	Toronto	1,750,000
Brampton Pressed Brick Company, Limited	March 10, 1905	Brampton	50,000
Buffalo and Leamington Oil and Gas Company, Limited	December 9, 1904	Windsor	100,000
Cobalt Development Company, Limited	October 6, 1905	Toronto	1,000,000
Cobalt Merchants' Mining Company	October 31, 1905	Toronto	200,000
Coleman Cobalt Mining Company, Limited	August 25, 1905	Toronto	250,000
Frances Gold Mines, Limited	February 1, 1905	Sault Ste. Marie	1,000,000
Hagersville Light and Fuel Company, Limited	March 24, 1905	Hagersville	40,000
Harris Oil Company, Limited	March 31, 1905	Windsor	100,000
Kerr Lake Mining Company, Limited	August 9, 1905	Toronto	40,000
Lake Huron Copper Mining Company, Limited	March 29, 1905	Thessalon	500,000
Liskeard Brick, Coal and Lumber Company, Limited	October 4, 1905	Toronto	40,000
Mac Mining Company, Limited	December 15, 1905	Toronto	350,000
New Ontario Cobalt and Silver Mining Company, Limited	August 15, 1905	Ottawa	1,000,000
Ogden Oil Company, Limited	July 12, 1905	Windsor	50,000
Ontario Gas and Fuel Company, Limited	October 20, 1905	Port Arthur	60,000
Ontario Smelters, Limited	August 25, 1905	Toronto	500,000
Osborne Oil Producers, Limited	June 14, 1905	Petrolia	100,000
Port Arthur Iron Mines, Limited	August 18, 1905	Toronto	500,000
Ruethel Mining Company, Limited	September 30, 1905	Windsor	250,000
Spider Lake Mining Company, Limited	July 12, 1905	Windsor	1,000,000
Sovereign Cobalt Mining Company, Limited	November 29, 1905	Toronto	200,000
St. Mary's Quarries, Limited	December 30, 1905	Saint Marys	200,000
Temagami Milling and Mining Company, Limited	November 10, 1905	Toronto	40,000
Temiscamingue Reduction Works, Limited	November 15, 1905	Cobalt	100,000
The Alexandra Oil and Development Company, Limited	October 11, 1905	Toronto	100,000
The Annabella Mining Company, Limited	November 3, 1905	Toronto	40,000
The Annie Milling Company, Limited	November 3, 1905	Toronto	40,000
The B. A. Pyrites Company, Limited	January 27, 1905	Toronto	750,000
The Banner Oil Company, Limited	June 14, 1905	Petrolia	100,000
The Beaver Mica and Mining Company, Limited	May 27, 1905	Sundridge	50,000
The Bessemer Iron Mines of Ontario, Limited	January 4, 1905	Sault Ste. Marie	200,000
The Big Dipper Mining and Milling Company, Limited	October 31, 1905	Peterborough	2,500,000
The Blanche River Mining Company, Limited	September 22, 1905	New Liskeard	40,000
The Breakhurst Oil Company, Limited	September 22, 1905	Sarnia	100,000
The Buffalo Mining Company, Limited	August 16, 1905	Fort Erie	50,000
The Buster Brown Oil and Gas Company of Ontario, Limited	April 3, 1905	Windsor	500,000
The Cain Brick Company, Limited	May 3, 1905	Ottawa	15,000
The Calumet and Algoma Mining Company, Limited	April 28, 1905	Sault Ste. Marie	1,000,000
The Canada Sand Lime Pressed Brick Company, Limited	June 19, 1905	Toronto Jct.	60,000
The Canadian Hart Corundum Wheel Company, Limited	September 14, 1905	Hamilton	75,000
The Canadian Northern Ore and Coal Company, Limited	February 17, 1905	Toronto	500,000
Tee Canadian Oil Refining Company, Limited	September 20, 1905	Toronto	100,000
The Chester Silver Mining Company, Limited	September 30, 1905	New Liskeard	25,000
The Cleveland Michipicoten Mining Company, Limited	August 25, 1905	Michipicoten R'vr	1,000,000
The Cobalt Canadian Mining and Milling Company, Limited	October 13, 1905	Kingsville	500,000
The Coleman and Bucke Consolidated Cobalt Silver Mining Company, Limited	July 28, 1095	Ottawa	1,000,000
The Coleman Development Company, Limited	September 22, 1905	Haileybury	300,000
The Copper Mining and Smelting Company of Ontario, Limited	August 15, 1905	Bruce Mines	1,000,000
The Dunnville Mutual Natural Gas Company, Limited	April 19, 1905	Dunnville	15,000
The Dymond and Abitibi Mining and Development Company, Limited	August 16, 1905	New Liskeard	25,000
The Elizabeth Copper Mining Company, Limited	January 27, 1905	Sault Ste. Marie	250,000
The Empire Gas and Oil Company, Limited	May 10, 1905	Windsor	40,000
The Fidelity Oil and Gas Company, Limited	April 19, 1905	Leamington	100,000
The Gas and Oil Company of Springvale, Limited	April 5, 1905	Springvale	40,000
The Gore Bay Brick and Tile Manufacturing Company, Limited	August 9, 1905	Gore Bay	3,000
The Gordon Cobalt Silver Mining Company, Limited	October 31, 1905	Toronto	200,000
The Haldimand Natural Gas Company, Limited	October 6, 1905	Dunnville	40,000
The Imperial Silver Mining Company of New Liskeard, Limited	October 6, 1905	New Liskeard	50,000
The Isa Mining Company, Limited	November 3, 1905	Toronto	40,000
The International Oil and Gas Company, Limited	March 22, 1905	Ingersoll	200,000
The Loughborough Mining Company, Limited	July 14, 1905	Sydenham	10,000
The Louise Mining Company, Limited	November 3, 1905	Toronto	40,000
The McCormick Cobalt Silver Mining Company of Toronto, Limited	December 13, 1905	Toronto	500,000
The Magpie Gold Mining and Development Company, Limited	February 1, 1905	Sault Ste. Marie	40,000
The Majestic Oil Company, Limited	October 4, 1905	Toronto	100,000

Table XVI.—Mining Companies Incorporated, 1905—*Concluded.*

Name of Company.	Date.	Head Office.	Capital.
			$
The Manitou Oil and Gas Company, Limited	April 5, 1905	Toronto	1,000,000
The Margaret Mining Company, Limited	November 3, 1905	Toronto	40,000
The Modern Brick and Stone Company, Limited	January 27, 1905	Toronto	200,000
The New Liskeard and Northern Ontario Mining and Development Company, Limited	May 5, 1905	New Liskeard	25,000
The New Ontario Ore Refining Company, Limited	August 9, 1905	Toronto	500,000
The Northern Exploration Company, Limited	September 22, 1905	Toronto	10,000
The Ontario Cobalt Development Company, Limited	December 20, 1905	Toronto	350,000
The Peterborough Sandstone Brick Company, Limited	October 11, 1905	Peterborough	50,000
The Petrolia Gas Company, Limited	November 24, 1905	Petrolia	40,000
The Pittsburg Cobalt Company, Limited	December 27, 1905	Toronto	75,000
The Pittsburg Gold Dredging Company, Limited	March 8, 1905	Peterborough	300,000
The Port Colborne-Welland Natural Gas and Oil Company, Limited	September 30, 1905	Port Colborne	50,000
The Port Rowan Natural Gas Company, Limited	May 27, 1905	Port Rowan	40,000
The Rothschild Cobalt Company, Limited	September 22, 1905	Haileybury	500,000
The Savage Cobalt Silver Mining Company, Limited	August 25, 1905	Toronto	250,000
The Selkirk Gas and Oil Company, Limited	April 26, 1905	Selkirk	10,000
The Silver Bar Mining Company, Limited	December 13, 1905	Ottawa	500,000
The Silver Five Mining Company, Limited	October 25, 1905	New Liskeard	40,000
The Silver Gulch Mining and Prospecting Company, Limited	October 31, 1905	Cobalt	75,000
The Silver Hill Mining Company, Limited	October 4, 1905	Mattawa	50,000
The Standard Silver and Cobalt Mining Company, Limited	September 22, 1905	New Liskeard	40,000
The Stratford Brick, Tile and Lumber Company, Limited	March 24, 1905	Stratford	40,000
The Sucker Creek Gas and Oil Company of Anderdon, Limited	August 9, 1905	Amherstburg	250,000
The Temiskamingue Mining Company, Limited	August 16, 1905	Haileybury	100,000
The Toronto Sand Lime Brick Company, Limited	March 22, 1905	Toronto Junction	40,000
The Triple Link Mining and Development Company, Limited	October 11, 1905	New Liskeard	40,000
The Twin City Brick and Supply Company, Limited	November 15, 1905	Port Arthur	40,000
The White Silver Company Limited	October 13, 1905	Toronto	100,000
The Windsor and Cobalt Mining Company, Limited	July 22, 1905	Windsor	150,000
Toronto Cobalt Mining Company, Limited	December 1, 1905	Toronto	300,000
			$27,509,000

Table XVII.—Mining Companies Licensed, 1905

Name of Company.	Date.	Head Office.	Capital.
			$
Breitung Iron Company	April 28, 1905		1,000,000
Detroit and Dominion Oil Company	February 10, 1905		1,000,000
Detroit Oil Exchange	April 5, 1905		30,000
Dominion Improvement and Development Company	December 20, 1905		10,000
Madoc Mining Company	December 14, 1904		40,000
Michigan and Ontario Oil Company	April 5, 1905		40,000
New Ontario Iron Company	June 19, 1905		1,000,000
New York Oil Company	May 31, 1905		1,000,000
The Ajax Production Company	June 14, 1905		40,000
The Canadian Klondike Mining Company	March 15, 1905		750,000
The Detroit and Kent County Oil and Gas Company of Ontario	August 16, 1905		40,000
The Detroit and Leamington Oil Company	February 28, 1905		40,000
The Hickey Oil Company	June 21, 1905		1,000,000
The J. B. and J. C. Mining Development and Smelting Company	December 13, 1905		10,000
The Leamington Comber Oil Company	March 29, 1905		40,000
The Pioneer Mining Company	January 3, 1905		50,000
The South Bay Oil Company	June 23, 1905		100,000
			6,190,000

THE DIAMOND DRILLS 1905

After the close of the year 1904 both of the drills owned by the Government were idle until July 1905, when the "S." or smaller drill, was again obtained by Mr. T. B. Caldwell to explore the iron ore body on the northeast arm of Lake Temagami. A description is given in the Fourteenth Report of the Bureau of Mines of a previous attempt to test this outcropping.

The drilling on this occasion was done 40 feet nearer the ore body, and at a depth of 72 feet in the first bore-hole mixed ore was struck, which continued for a depth of 12 feet. Nothing further of value was encountered in the remainder of the 156 feet, the depth to which this ore was bored, and the drill was moved to number 2 prospect, about 300 feet across the vein. In this hole, at a depth of five feet, the water was lost, necessitating the putting down of a reaming bit. At a depth of 71 feet the drill was still in the greenstone, and work on the property was abandoned.

The gross cost of drilling the three holes—one in 1904 to a depth of 194 feet, and the two in 1905 to an aggregate depth of 227 feet, making a total of 422 feet—amounted to $3,042.58, or $7.23 per foot, the net cost to the operator being $1,797.68, or $4.69 per foot; the gross cost of diamonds being $3.43 per foot.

From lake Temagami the drill was removed early in November to the silver-cobalt mine, near Cobalt, belonging to the La Rose Mining Company.

On account of the extremely shattered character of the rock in this prospect, the loss of diamonds was unusually great, and the wear and tear on the drilling plant was severe.

The total cost for this bore-hole, 183 feet in depth, mostly in slate conglomerate, amounted to $1,474.60, or $8.06 per foot, and the net cost to the operators was $958.50 of $5.24 per foot, while the gross cost of diamonds per foot was $5.50.

The plant was then moved to lot 15 in the first concession of the township of Bucke, to the property known as the Benn mine, owned by Dr. C. K. Leith, of Madison, Wis., and his associates.

Two prospects were tested, the total depth bored being 360 feet.

Great difficulty was experienced in this work on account of the extremely hard and broken nature of the rock, which caused great loss of diamonds and more than the usual amount of wear and tear on the plant. Work on this property was finished March 17th, 1906, and the drill was stored at Haileybury.

The gross cost of drilling the 360 feet was $2,808.44 or $7.80 per foot, the net cost to the operators being $1,825.48 or $5.07 per foot, and the gross cost of the diamonds per foot amounting to $3.62.

The "C" drill which was last in commission on the iron ore properties belonging to Wiley and Company near Loon lake, east of Port Arthur, was applied for by Mr. R. Richardes to explore a deposit of limestone near Port Colborne.

On lot 27 in the first concession of Humberstone township, four holes were bored, the total aggregating 78 feet, the limestone varying in depth from 7 to 16½ feet and being mixed with flint.

Twenty-one prospects were explored on lot 6 in the first concession of the township of Wainfleet, the total depth of which amounted to 404 feet, in which the depth of the limestone varied from 10 inches to 22 feet, in some cases being mixed with flint.

Three holes were bored on lot 7 in the first concession of Wainfleet, to a total depth of 41½ feet, the depth in the limestone varying from 8 to 20 feet.

The drill was then moved back to the township of Humberstone, on lot 33 in the first concession, on which five holes were bored, the total depth of which aggregated 126 feet, the thickness of the limestone varying from 9 to 23 feet.

In all, 33 holes of a total depth of 650 feet were bored, at a total cost of $1,292.05 or $1.99 per foot, costing the operators, net, $839.84 or $1.29 per foot, the gross cost of diamonds per foot for this service being 30 cents.

Early in November the drill was moved from Humberstone to the town of Paris for the purpose of exploring gypsum deposits in and about the above named town, in the county of Brant.

The drift overlying the deposit was very heavy, and it was difficult to put down the casing pipe on account of the boulders and loose gravel. The rock cut by the drill was limestone and shale, with narrow bands of gypsum.

The depth of the one hole bored was 200 feet, at a total cost of $409.21 or $2.05 per foot, and the net cost to the operators was $265.98 or $1.33 per foot. The gross cost of diamonds per foot was .08½ cents.

The drilling, including the work done in 1904 on the iron ore outcroppings on the northeast arm of Lake Temagami, amounted to 1,815 feet, at a cost of $9,026.88 or $4.97 per foot, the net cost to the operators being $5,867.48 or $3.23 per foot, while the average gross cost of diamonds per foot was $2.19.

Summary of Operations with Diamond Drills in 1905

Name of Person or Company	Location of Drilling	Kind of Mineral	Rock drilled through	Total depth drilled	Total Cost	Total Cost per ft	Net Cost	Net Cost per ft.	Gross cost of Diamo'ds per ft.	Drill
				ft	$	$	$	$	$	
T. B. Caldwell........	Mining Locations on the northeast arm of Lake Temagami	Iron	Greenstone, quartz, diorite, chert and gray granite..................................	422	3,042 58	7 23	1 977 68	1 69	3 43	"S"
La Rose Mining Co...	Mining Location JS14, township of Coleman......	Silver-cobalt	Slate and conglomerate......................	183	1,174 60	8 06	958 50	5 45	5 50	"S"
C. K. Leith	Lot 15 in the first concession of Bucke.........................	Cobalt..	Conglomerate, broken slate and graywacke	360	2,808 41	7 80	1,825 48	5 07	3 62	"S"
R. Richardes......	Lots 27 in the second and 33 in the first concessions of Humberstone and lots 6 and 7 in the first concession of Wainfleet..	Lime-stone..	Limestone, flint, sandstone and slate	650	1,292 05	1 99	839 84	1 29	30	"C"
Alabastine Company..	Paris, county of Brant...........	Gypsum	Shale, gypsum and limestone.......... .. .	200	409 21	2 05	265 98	1 33	08½	"C"
			Total	1,815	9,026 88	....	5,867 48			
			Average	....	....	4 97	....	3 23	2 19	

MINING ACCIDENTS

In 1905 there were eighteen accidents reported to the Bureau of Mines, nine of which were attended wth fatal consequences. The majority of the casualties occurred above ground, no less than eleven men being injured, four of them fatally, and seven seriously, in working about the smelters and furnaces. Most of these accidents might apparently have been prevented by a little care on the part of the injured men.

A serious accident occurred at the Helen mine in 1904, which was not reported to the Bureau until January of the present year (1906). Carelessness on the part of Alex. McTavish, who brought a torch too near some caps, causing an explosion, resulted in the loss of his eyesight.

The Algoma Steel Company

In August two fatal accidents were reported by The Algoma Steel Company, Limited, Sault Ste. Marie, as having occurred at their blast furnace. On the 5th of that month, as Guiseppe Zoccali was walking along the railroad track alongside the furnace, he was struck by an engine backing up with a slag car. His right leg and left arm were almost severed from his body, causing death in about half an hour.

The second fatality occurred on the 11th, Guiliano Martino being the victim. He was standing on the edge of a hopper car prying open the door on the dust pipe with a bar when he overbalanced and fell to the ground, striking his head on the concrete foundation and causing dislocation of the neck.

In both of the above cases the coroner, Dr. J. D. McLurg, investigated the circumstances, and decided that death in each case was purely accidental and that no inquest was necessary.

On February 12 at 10 o'clock a. m., an accident occurred at the ore stock pile of the blast furnace department of the above company, whereby Jacob Johnston lost his life.

The foreman and six men were breaking frozen lumps at the foot of stock pile, when unexpectedly a portion of the ore loosened from the pile and slid down a distance of about twenty-five feet. With the exception of Johnston all escaped. He was buried not more than a few seconds when he was uncovered and was found alive, but before he was dug out below his waist a second slide came from the same place and again covered him, also partly covering one of the men, Samuel Thompson, who was assisting in Johnston's release.

Johnston had been covered one hour and fifteen minutes before he was got out a second time, and then he was dead.

There was no apparent reason why the pile should slide, as it was sloping from the top and appeared solid and perfectly safe, and the occurrence seems to have been purely accidental.

American Madoc Mining Company

The iron pyrites mine belonging to the American Madoc Mining Company was the scene of an accident on February 14th, whereby James Miller was injured while blasting underground. He had finished drilling a round of holes, which were more or less widely separated, and misjudged the length of fuse necessary to allow him to fire same and retire to a place of safety, with the result that the holes began to explode while he was still in a partially exposed position. He received a wound in the back of the shoulder as well as one on the scalp, neither of which, however, proved serious. At the end of a couple of weeks he was able to resume work.

Canadian Copper Company

At the mines and works of the Canadian Copper Company, Copper Cliff, eight accidents occurred in 1905, six in the smelters, of which two were fatal, and two in the mines, both of which resulted in the death of the injured men.

On January 12th an electrician named John Johnston had his right hand taken off by the electric crane in the smelter. He and another man were fixing a bell on the crane track, and apparently Johnston lost his head, for instead of going ahead of the crane he attempted to get into a window frame to allow it to pass, in doing which his hand was caught by the window and taken off at the wrist by the crane. The injured man was at once removed to the hospital, from which place he got his discharge about the end of the month, his wrist being almost healed over.

On March 29th a Finlander named Ithel Davis, while assisting with a team to unload a car of castings at the car shop, had some of the bones of his ankle broken by the canting over of one of the castings. He was removed to the hospital, and about a month later a report was received from the company to the effect that he was recovering favorably and would be ready to leave the hospital in the early part of May.

On April 6th, Fred. Hargraves was accidentally killed while engaged in scaling down one of the company's furnaces at the new smelter. The coroner, Mr. Thomas Oliver, was notified, but he did not consider an inquest necessary. His report on the occurrence is substantially as follows:

The furnace in which the accident occurred had been shut down for repairs. Four men, one of them Hargraves, were sent to scale the hood—the first part of the large pipe which carries the smoke from the furnace to the large stack. In this hood was a great accumulation of a slag-like substance, partially hardened and stuck together. The distance from the top of the furnace was about ten feet. Four 6 x 8-inch timbers had been placed across the furnace, and on these planks were laid. Ladders had to be used to reach the portion requiring scaling, and the work to be done necessitated the use of crowbars and hammers.

Shortly after the work had been commenced a great mass of slag loosened itself from the hood and fell, without warning, carrying the men with their equipment down to the scaffold across the furnace, which broke with the weight, precipitating men, slag, ladders, timbers and planks to the bottom of the furnace. Only one of the men, Hargraves, was under the debris, and when taken out he was dead. He was badly bruised and smashed, especially about the head, and death may have been due to these injuries or to suffocation. The unfortunate occurrence seems to have been entirely accidental, and no responsibility therefor was attributable to anyone.

On April 12th an Italian, Michel Fasciono, (Mike Fisher) was fatally injured by the premature explosion of a sand blast. The coroner, Mr. Oliver, was notified and an inquest held. The evidence taken at the inquest was to the effect that a number of sand blasts had been loaded, that when the order to fire them was given by the foreman one blast exploded as soon as it was lighted, for no known reason, and the explosion injured Fasciono, or "Fisher" as he was called. After the explosion Fisher was able to go as far as the first level, when he fell. He was taken to the hospital, where he was found to be suffering from internal hemorrhage of the left lung, and a post mortem examination showed this to be the cause of death, all the organs being in normal condition. The verdict of the jury was as follows: "The verdict of the jury regarding the accident at Creighton mine on April 13th is accidental, all agreed; but we would suggest that a capable man or men be engaged to do blasting and more precaution used," this report being signed by each of the jurors.

On May 16th, Thomas Malloy, an electrician engaged in the smelter, while endeavoring to replace a cable which had slipped from the groove on the drum of the electric crane's main hoist, had his foot caught between a gear wheel and the frame of the

crane, so crushing the first and second toes of his left foot that they had to be amputated. He was able to be discharged from the hospital in about two weeks' time.

The quartz quarry belonging to the above company was the scene of the next accident, which occurred May 20th, and resulted in the death of Arthur McGinley, the crusher feeder. While a loaded car was being shoved back from the chute, and an empty car put in its place by two men with pinch bars, the deceased descended from the crusher floor and went to a ditch to get some water. No one had seen him go between the cars, and he had no occasion to go near them, but he was found caught between the draw-bars of the quartz cars, facing the approaching car. The bumpers caught him in the pit of the stomach, and there was no external mark save a slight bruise.

Dr. Webb, the hospital physician, who is a coroner for Algoma, and who is also in the employ of the Company, made an investigation and reported practically as above, being of the opinion that an inquest was unnecessary.

On account of the quartz quarry being situated in the district of Algoma, and no other coroner than the above-named Dr. Webb being near at hand, Mr. A. P. Turner, president of the company, himself visited the locality, and made an investigation. He referred the matter to the local coroner, Mr. Oliver, who said he could not act in Algoma, but who gave it as his opinion that there was no necessity for an inquest.

Some of the men working with the deceased seemed to think his action in placing himself between the cars was premeditated, as he had been very despondent for some time and was frequently heard to wish that he was dead.

On Saturday, June 3rd, an Italian, Gustenzo Montenaro, had both bones of his left leg fractured, midway between the knee and ankle, while attempting to jump on a moving train from the charging floor in the smelter. He was removed to the hospital, and two weeks later was reported as doing well.

On December 21st a drill runner named Isaac Wirtanen, with four other men, was engaged in No. 2 mine in loosening the drilling machine from the tripod. As they were in the act of carrying it away Wirtanen slipped down about eight or nine feet to another bench about six feet wide, landed on his feet, and then fell headlong into the stope below, a distance of twenty-five feet. He was carried up and taken to the hospital, where it was found his skull was fractured. He died from the effects of the injury about an hour and a half after reaching the hospital.

Mr. Thomas Oliver, coroner, investigated the case and decided no inquest was necessary.

Kingston Feldspar and Mining Company

The Kingston Feldspar and Mining Company, operating the Desert Lake mine, reported an accident at the above-named property on November 15th to one Frank Judge, who lost three fingers of his right hand. While repairing a hoist, his hand was caught between the friction and the drum, and while in that position the engine moved enough to cut off his fingers.

Massey Station Mining Company

At 8.30 o'clock on the morning of March 16th an accident occurred at the Massey mine whereby Bartolomeo Galluccio received such injuries that he died the next day.

The man was an Italian, and at the time of the accident was helping the assistant superintendent to put a sheet of iron into the bucket. No one appeared to know just how he fell, beyond the fact that he let go his end of the sheet of iron and fell to the bottom of the skipway, where he was wedged between the skip and the foot wall.

The statement having been made that the skipway was not in safe condition, as there was no guard to prevent a man from falling down, and Galluccio could not understand English, the coroner, Dr. Struthers of Sudbury, was notified. He re-

ported that he took the sworn statements of Messrs. Needham and Summers, assistant superintendent and mining captain, respectively, from which and from the facts gleaned, he did not think it necessary to empanel a jury.

It appeared that Gallucio was engaged with the assistant superintendent in loading some iron plates from the floor of the fourth level of the shaft into the bucket to send down the shaft. There was a skipway and a bucket way, and the man in his eagerness stepped over the edge of the skipway and was killed. He had worked at the mine fifteen months and underground some weeks and was practically familiar with the mine and the shaft. The coroner gave it as his opinion that the shaft, skip and bucket way were all right.

Under the circumstances it was decided that a special inquiry should be made, and Mr. E. T. Corkill, Inspector of Mines, was instructed to proceed to the locality and report the result of his investigations.

Mr. Corkill reported as follows:

"After examining the place at which the accident happened I concluded it would be necessary to hold an investigation, which I did March 30th at 9 o'clock, taking the evidence under oath of J. O. Summers, mine captain, Jarvis Guise, timberman, W. Witty, drill runner, Thos. Brown, assistant timberman.

"The deceased was an Italian, by name Bartolomeo Gallucio, but on the pay roll of the company as B. Carlo. He had been in the employ of the company for some eighteen months. During that time, according to the evidence of the mine captain, J. O. Summers, deceased had several times been sent into the mine to work for a short time, in all about two weeks. At the time of the accident he had been at work under ground mucking since March 15th, that is, he was on his second day's continuous work.

"On the morning of the accident deceased had been mucking on the fifth level. The mine captain with two other men were working on the fourth level putting in a pump. Previous to this time an air siphon had been in the shaft about 15 feet below the fourth level. This had not proved satisfactory, and was being replaced by a pump on the level. About 8.15 the assistant superintendent, E. V. Neelands, had called for a man to come up from the fifth level to assist in getting an iron plate from the fourth level to be sent down to the fifth. Apparently no one of the muckers in particular had been called, but the deceased had come. At this time there were on the level the mine captain, J. O. Summers, assistant superintendent E. V. Neelands, Tom Brown and Alf. Summers, engaged in piping, and the deceased.

"The assistant superintendent and deceased had gone in on the east drift, got the iron plate and returning with it to the shaft, laid it down on the platform between the skip and bucket road, waiting for the bucket in order to send it to the level below. When the bucket came the assistant superintendent and deceased picked up the plate and, according to one of the witnesses, the deceased must have stepped backwards in order to let the other end of the plate be put in the bucket. In so doing he stepped into the open shaft, which at that time had no guard rail on it. Apparently no one saw him fall. The distance between the fourth and fifth levels is 80 feet, and the shaft is on an incline of about 87 degrees north. Deceased was found on the level below lodged on the bed piece between the foot wall and the skip. He was picked up apparently conscious with a bad scalp wound, taken to the surface, and Dr. Baker of Massey telephoned for. I saw Dr. Baker and he gave me an account of his injuries. He saw the injured man one hour after the accident. On examination he found him to have a serious scalp wound, which would probably cause concussion, rib broken, and intestinal hemorrhage. Dr. Baker visited the deceased twice, and stated that death resulted from injuries received by falling down the shaft in the Massey mine on March 16th.

"I found when I inspected the mine on the 29th that the guard rail was in place on the fourth level, and everything around the shaft fitted up according to the Mining

Regulations. However, according to evidence given, the guard rail was not in position at the time of the accident. The mine captain had ordered this to be put in prior to the accident. It was claimed by the mine captain that the guard rail could not have been in position at the time of the accident without interfering with work that was carried on in piping, etc. This was not substantiated by one of the witnesses. All the witnesses called were of the opinion that the mine was in a safe condition, and that great care was taken by the management to keep it so. They also claimed the accident was due to the deceased's own carelessness, and that the company were entirely free from blame.

"However, the Mining Regulations distinctly state that all openings to the shaft shall be securely fenced. This had not been done by the company, contrary to the Regulations, and also in violation of the instructions of Mr. Carter (Inspector of Mines) at previous inspections.

"It is immaterial whether guard rails could have been in position at the time or not without interfering with the work being done. It is sufficient that the guard rail had not been put in before the accident, and consequently was not in place to be used if it had been possible.

"To sum up, I may say that the company, by neglecting to put in the guard rail around the shaft on the fourth level left themselves liable to blame for the accident. If the Inspector's instructions had been carried out and lived up to, no accident would have occurred, as it would have been impossible to fall down the shaft from the fourth level platform with the guard rail in proper position.

"I also recommend that greater care should be taken by mine superintendents in placing green workmen in places where there is any danger, before they are familiar with the surroundings."

The Mond Nickel Company

At Victoria Mine No. 1, belonging to the above company, Paul Cyr was injured in the knee on February 11th while breaking up some pieces of ore with dynamite. The injury was not considered a serious one.

On December 14th Jan Jokela was so severely injured by a sand blast that he died the next day from the effects of concussion and shock.

The details of the accident are as follows: Jokela was mucking on the fourth level, east stope, where he had been placed by the foreman, who had ordered the machine runner in this stope to do certain sand-blasting as soon as the large pieces of ore had rolled down into convenient positions. The part of the stope where the machine men were working was safe from any sand-blasting. Jokela, contrary to mine rules, apparently undertook to blast for himself. The fact that the shot immediately followed his shout of "Fire" seemed to indicate that he had not safely covered the dynamite, which was ignited by the fuse spitting into it.

His injuries, except the almost complete severing of the biceps of his left arm, were not serious, and every care was taken to prevent loss of blood. No bones were broken, and he remained conscious with apparently good chances of recovery for over twelve hours. He then began to sink, and died twenty-three hours after receiving the injury.

The coroner was not notified, as the doctor in attendance did not consider an inquest necessary. Inquiry by the Bureau as to how explosives were handled in this mine elicited information which showed that care is taken in the storage and handling of explosives.

James Richardson & Sons' Feldspar Mine

The first accident at the feldspar mine, near Verona, owned and operated by James Richardson & Sons, occurred on March 24th to a man named Johnston. He was

digging a trench about 500 feet from the mine and some loose rock and soil fell on him while he was lifting a heavy stone and broke his leg. He was well taken care of at the hospital.

In the several years this mine has been working this is the only accident that has occurred.

S. E. Quarter N. Half 8 in 4, Coleman

It was reported to the Bureau that on November 13th a driller named Paul Graelle employed by M. E. W. B. Morrison on the above prospect met with a serious accident.

It appeared that Graelle carried a handful of detonating fuses in his trousers pocket, and in using his pick the handle struck his leg and the fuses exploded, lacerating and burning the upper part of the thigh and groin. Graelle's right hand, which was on the end of the pick, was also injured. The leg was not broken nor the artery severed, and on Dr. Codd's advice the injured man was sent to the hospital at North Bay, where it was thought he might recover if blood poisoning did not set in.

Ten days after the accident the Bureau was notified that Graelle was still improving.

The injured man had recently come from France, and had a certificate as to his ability to handle explosives from the French Government.

It seemed that no blame was attachable to anyone but the injured man himself, who showed great carelessness in working with fuses on his person.

Table of Mining Accidents, 1905.

No.	Date.	Mine or works.	Name of injured person.	Result of Injury. Slight.	Serious.	Fatal.	Above ground.	Below ground.	Nature of injury	Cause of Accident
1	Jan. 12	Canadian Copper Co., Smelter	John Johnston		1		1		Right hand taken off	Caught by electric crane
2	Feb. 12	Lake Superior Corporation	Jacob Johnson			1	1		Smothered	Buried in slide of ore.
3	" 13	Mond Nickel Co., Ltd	Paul Cyr	1				1	Knee injured	Premature explosion of dynamite
4	" 14	American Madoc Mining Co	James Miller	1				1	Scalp and shoulder wounded	" " "
5	Mar. 16	Massey Station Mining Co	Bartolomeo Gallucco			1		1	Internal injuries	Fell from 4th to 5th level.
6	" 24	Richardsons' Feldspar Mine	——Johnston		1		1		Broken leg	Fall of rock and soil
7	" 29	Canadian Copper Co., Car Shop	Ithel Davis		1		1		Ankle bones broken	Fall of heavy casting.
8	Apr. 6	Canadian Copper Co., Furnace	Fred Hargraves			1	1		Head smashed	Fall of scale while scaling furnace
9	" 12	Canadian Copper Co., Creighton mine	Mike Fisher			1		1	Internal injuries	Premature explosion.
10	May 16	Canadian Copper Co., Smelter	Thos. Malloy		1		1		First and second toes of left foot crushed	Foot caught between gear wheel and frame of crane.
11	" 20	Canadian Copper Co., Quartz mine	Arthur McGinley			1	1		Crushed	Caught between two loaded cars
12	June 3	Canadian Copper Co., Smelter	Gustenzo Montemaro		1			1	Bones fractured between knee and ankle.	Attempted to jump on moving train
13	Aug. 5	Algoma Steel Co., Blast furnace	Guiseppa Zoerali			1	1		Right leg and left arm almost severed	Struck by engine.
14	" 11	Algoma Steel Co., Blast furnace	Guilliano Martino			1	1		Neck dislocated	Fell from edge of car on concrete foundation.
15	Nov. 13	E. W. B. Morrison's Mine	Paul Graelle		1		1		Thigh and groin lacerated and burnt	Explosion of detonating fuses
16	" 15	Kingston Feldspar Mining Co	Frank Judge		1		1		Loss of three fingers of right hand	Starting up of engine while repairing hoist
17	Dec. 14	Mond Nickel Co., Ltd.	Jan Jokela			1		1	Biceps of left arm severed and shock	Premature explosion
18	" 21	Canadian Copper Co., No. 2 Mine	Isaac Wirtanen			1		1	Skull fractured	Fell 30 feet down stope
		Total casualties		2	7	9	11	7		

PROVINCIAL ASSAY OFFICE

The assayer in charge, Mr. A. G. Burrows, B.Sc., renders the following account of the work done at the Provincial Assay Office, Belleville, during the year 1905:

The Provincial Assay Office was established in July, 1898, by the Ontario Government, as an aid to the mineral development of the Province. The office has rendered many services for the public, as is shown by the large number of assays and analyses made The rates are sufficiently low to allow prospectors and others to have their finds examined at low cost. The office is well fitted with assay and analytical apparatus for the testing of the various ores and minerals which are distributed so widely through the Province.

As in former years, the bulk of the samples came from the newer settled portions of the Province, where the search for mineral wealth is very vigorous. Probably the most active territory was that adjoining Lake Temiskaming, where the recent finds of valuable ores of cobalt, nickel and silver were made. From many points, and some at a distance from Cobalt, samples showing cobalt bloom were received, indicating a probability of other fields of importance being found. Besides the ores above mentioned, this region sent in some promising specimens of galena, copper pyrites, iron ore, and also gold ore. The Loon lake region of western Ontario supplied some excellent samples of hematite iron ore, and the Michipicoten district some bog iron ore, somewhat high in sulphur, but otherwise of suitable quality. Many samples of low grade copper ore, the copper-bearing mineral being copper pyrites, were received from the country north of lake Huron. The large number of copper propositions in this vicinity should be able to supply a centrally located smelter with ore.

In the North Hastings mineral belt, there was considerable activity, particularly in sulphur, iron, copper and gold ores.

From other parts of the Province were received gold, zinc, lead, molybdenum, copper and other ores, and also limestones, clays, feldspar and corundum.

During the year 848 samples were analyzed in whole or part, with percentages of constituents given, and 186 samples reported on as to probable commercial value. The amount of fees collected for this work was $1,084.69, which was remitted to the Bureau of Mines. The value of the work performed for the Bureau was $900.00, making the total value of work $1,984.69.

Work for Bureau of Mines

(*a*) Analyses and assays of samples of minerals and ores collected by Government Geologists during their summer's explorations.

The samples submitted included:

(1) Hematite iron ores from the iron ranges of western Ontario.

(2) Clays and peats from the northern portions of Algoma and Nipissing.

(3) Rock analyses of samples from the cobalt-nickel-silver district of Temiskaming.

(*b*) Additional analyses of clays, for a report on the Clay Industry of the Province.

(*c*) Analysis of a series of limestones, clays, and marls, for a report on the Cement Industry of the Province.

(*d*) Analyses of samples of iron ore for the Iron Mining Fund. This was discontinued early in the year.

Work for the Public

(*a*) Issuing reports, consisting of assays, analyses, and identifications of samples, submitted for test.

(*b*) Supplying information, where possible, to owners of mineral lands, who desire to know of probable purchasers; and also advising as to uses, value, etc., of their minerals.

(c) Sending typical samples of ores and minerals to prospectors who desire to use them for comparison.

The following list of determinations will show the laboratory work for the year:

	Assays for Bureau.	Assays for Public.	Total.
Gold	65	374	439
Silver	92	257	349
Copper	8	122	130
Cobalt	12	47	59
Nickel	15	55	70
Manganese	0	8	8
Molybdenum	0	1	1
Zinc	0	18	18
Platinum	0	4	4
Lead	0	22	22
Arsenic	6	9	15
Antimony	1	0	1
Tin	0	3	3
Total	199	920	1,119

	Analyses for Bureau.	Analyses for Public.	Total.
Metallic iron	24	70	94
Alumina	84	30	114
Silica	76	37	113
Lime	88	36	124
Magnesia	88	24	112
Ferric oxide	88	13	101
Ferrous oxide	5	0	5
Sulphur	111	58	169
Alkalies	112	1	113
Phosphorus	5	32	37
Titanium	0	12	12
Organic matter	17	0	17
Miscellaneous	123	26	149
Total	821	339	1,160

Total assays	1,119
" analyses	1,160
" identifications	183
Total determinations	2,462

The following methods of analysis are in use:

Gold and silver: (1) By fire assay. In this process the crucible assay, on one assay ton of ore is used, and to a small extent the scorification assay on rich ores, consisting of sulphides or arsenides. The assay room is fitted with one large Hoskins gasoline furnace and a small combination gasoline furnace, also a gas roasting furnace. (2) By bottle amalgamation assay, to test the free-milling character of the ore.

Platinum: By combination fire and wet assay.

Cobalt and Nickel: By electrolytic method, the metals being plated together, dissolved in acid, and the cobalt separated by means of potassium nitrite.

Copper: By electrolytic and cyanide methods, also by iodide method on mixed sulphide ores.

Lead: By molybdate method.

Other metals are determined by standard methods.

Notes

In sending in samples it is desirable to have them not more than three pounds in weight. All samples are quartered and pulped to 100-mesh. Wet samples are dried at 100 C., and analysis reported at that temperature. Circulars of rates and mailing envelopes are supplied to those desiring to send in samples for examination. It is desirable that all fees should be forwarded with the samples, so that there may be no delay in issuing reports.

Samples brought to the office are examined free of charge, except where a quantitative determination is required.

One laboratory assistant, Mr. W. J. Embury, was employed during the year.

TEMISKAMING MINING DIVISION

In order to cope with the rush of prospectors into the Cobalt region which was foreseen would take place as soon as the snow left the ground in the spring of 1905, and to provide a speedier means of dealing with applications for mining lands, the district was set apart as the Temiskaming Mining Division under the regulations provided for such Divisions by authority of the Mines Act 1897. These regulations required all prospectors to take out a miner's license, to stake out their claims on the ground and to record them in the office of the local inspector or agent. The head office of the Division was fixed at Haileybury, and Mr. George T. Smith was appointed Inspector. The arrangement proved a very convenient one, and indeed it is difficult to see how the situation created by the advent of hundreds of prospectors and claim-seekers into this hitherto little known region could have been satisfactorily dealt with except by some such locally conducted system as was thus brought into operation. Under the regulations for Mining Divisions the size of claims was limited to 40 acres. The date of the Order-in-Council setting apart the Temiskaming Division was 5th April, 1905. Subsequently, the township of Coleman was constituted a separate Mining Division, and mining claims therein were reduced to 20 acres—10 chains in width by 20 chains in length. The date of this Order-in-Council was 30th October, 1905.

SUMMER MINING CLASSES

BY W. L. GOODWIN

Itinerary

On Saturday, April 22nd, and Monday, the 24th, the boxes of mineral specimens to be used during the summer were prepared. As the work has been expanded and systematized, the number of mineral specimens to be distributed has been increased, so that their preparation has now become a considerable task. Some idea of its magnitude can be gathered from the statement that about forty different species are distributed and that every student receives a specimen of each species.

Mr. J. Watson Bain was to have been my colleague again, but a telegram received shortly before the time set for leaving Kingston informed me that he would be unable to come. Until an appointment was made in his place, I took Mr. W. M. Goodwin with me, and left Kingston on Tuesday, April 25th, for Bedford station on the Kingston and Pembroke railway. It had been arranged with Messrs. Jas. Richardson & Sons to hold a class at their feldspar mine a few miles from this station. We drove four miles eastward to the landing on Thirteen Island lake where the mine tug was lying. Here the mine superintendent, Mr. M. J. Flynn, took charge of us and our luggage. After a run of a mile and a half we landed and walked to the mine, the property of the Kingston Feldspar and Mining Company. It lies between Thirteen Island lake and Desert lake, but nearer the latter.

On the evening of the 26th we were joined by Mr. E. G. R. Ardagh, B.A.Sc., of the School of Practical Science, Toronto. Mr. Goodwin therefore returned to Kingston on the 28th, taking with him a good supply of feldspar, black hornblende and glassy quartz, which had been collected and packed the day before.

On Thursday, May 4th, we left the feldspar mines to go to the mica mine of the General Electric Co., situated near Sydenham. The manager, Mr. G. W. McNaughton, had arranged that I should meet him in Sydenham on Monday, May 8th. This left two days in Kingston, which were utilized in improving and completing the mineral collections. Mr. Ardagh was obliged to go to Toronto on business and did not join me again until May 10th. In the meantime the gap was filled again by Mr. Goodwin, who accompanied me to Sydenham on May 8th. We took the morning train (K. & P.) for Harrowsmith, and drove 3½ miles from that place to Sydenham. The Company's tug was in readiness to take us up Sydenham lake. The mine captain, Mr. Henry Smith, accompanied us and saw to the transportation of the luggage from the landing place to the mine.

On Monday, May 15th, the General Electric mine was left behind. The Bay of Quinte railway took us from Sydenham to Tweed (46 miles), where we changed to the C. P. R., and arrived at Kaladar station (17 miles) at 1.15 p.m. Deline's stage took us northward through Cloyne (14 miles) to the Star of the East mine on Marble lake, five miles from Cloyne. The miles are very long in that country. Near Kaladar the Laurentian hills are steep and rugged, but after these are crossed the road is fairly level and smooth. We were received in the kindest manner by Messrs. Wm. Vincent, superintendent, and E. Copeland, clerk.

On Tuesday, May 23rd, we left the Star of the East and proceeded to Bannockburn *via* Kaladar and Tweed, arriving that evening. Next day we drove to the Jarman pyrites mine where we found Mr. Burnside in charge with Messrs. Avery and Miller as shift bosses.

On Wednesday, May 31st, we drove to the Craig gold mine, 6 miles northeast of Bannockburn, passing the Hollandia lead mine on the way. The manager of the latter, Mr. Cushman, told me that he had 30 men at work. They were sinking a new shaft and had struck an eight-foot vein at 110 feet. Development work was being pushed. The Craig was reached at noon, and manager Hungerford gave us his usual hearty welcome.

On Tuesday evening, June 6th, the return to Bannockburn was made. The next morning I returned to Kingston by Bay of Quinte railway, and Mr. Ardagh proceeded to Toronto.

Work was resumed on Thursday, June 15th, when I left Kingston for Barry's Bay, on the C. A. R., *via* Renfrew. At Barry's Bay I met Mr. Ardagh, who had come by way of Scotia Junction. The yacht of the Canada Corundum Company took us southward to Craigmont (18 miles). The manager, Mr. Kerr, entertained us with his unfailing hospitality.

On Saturday, June 24th, the company's steamer was ready to take us back to Barry's Bay. As we were leaving the landing, the engineer was blinded by the bursting of the steam gauge. The captain was obliged to take his place, and a wheelman was found among the passengers. We reached Barry's Bay in safety, and took the injured man on with us toward Ottawa, where he was to be sent to the hospital.

Having spent the Sunday in Renfrew, we proceeded on Monday to North Bay, where we connected with the Temiskaming & Northern Ontario railway for Haileybury. The tender jumped the track a few miles north of North Bay,—and Haileybury was not reached until 11 p. m.

On Tuesday, July 4th, we drove to New Liskeard, and on Tuesday, July 11th, we proceeded to Cobalt by the T. & N. O. R.

Tuesday, July 18th, saw us ready to make an early start for Giroux lake. Mr. H. E. Savage, owner of a prospect about half way to our destination, undertook to pack the baggage over the trail. He with a packer, Cryderman, and Messrs. Ardagh and George Sharp, went on with the baggage, while I remained to transact some business. When I arrived at Giroux lake late in the afternoon I found the stuff all there and the tent up. We camped near the old lumber camps, some of which were being used by the Fosters, who were developing their valuable mine on Glen lake, a short distance from Giroux lake.

Our outfit was on Tuesday, July 25th, again moved satisfactorily by two of Mr. Savage's miners, who may also be partners of his for aught I know. One is not safe in judging by appearances in this district. The goods were safely delivered at Cobalt station in time for us to catch the train for North Bay.

Webbwood was reached on Wednesday, July 26th. We loaded our stuff on to Dupuis' cart and managed to dodge the showers all the way to the Shakespeare mine, which is about four miles away.

The work was closed on Aug. 1st, the last place on the list, Gold Rock, being omitted, as the appropriation was exhausted. We started for the east on August 2nd, and arrived in Toronto and Kingston on the 3rd.

Desert Lake Feldspar Mine

This mine, the property of Jas. Richardson & Sons, Kingston, produces a considerable fraction of the feldspar used in the United States. The deposit is worked as a quarry, and immense blocks of very pure feldspar are broken off by every shot. The floor of the quarry is mostly feldspar. This will be worked to a lower level, as the water is now drained off by a ditch cut through a clay basin lying between the feldspar deposit and Desert lake. This ditch showed that the feldspar extends at the lower level considerably beyond the present workings. There were 24 men employed.

The class was opened on April 26th at 6.30 p. m. The men sat out-doors on seats improvised from the wood pile. We thus made the most of the waning light of the comparatively short April evenings. There were a few men present who had walked from Harris' and Chisholm's feldspar mines. The class was held every evening. out-doors when the weather permitted, in the "dry" when rain or April winds drove us to shelter. After the distribution of minerals, we adjourned to the dining room for a lantern lecture on geology or mining.

This mine is the best locality in the Province for cleavage pieces of pink feldspar. Pieces of great size can be found, and sometimes long, very thin, slabs, almost transparent are met with. Under the guidance of the superintendent, Mr. Flynn, we were able to collect large quantities of barite at Howe's farm. about two miles from Bedford station. The barite is deposited with calcite in a cavity in the crystalline limestone. It is mostly fine-grained and would grind very easily, but it is much mixed with the calcite. Some of it has been precipitated in a loose friable condition. The calcite crystals are often large and well-formed. The shaft is about 30 feet deep, but work had been discontinued when we were there, and the shaft was full of water. The ore pile contained about 150 tons. Apatite is found in this district. There is a large deposit on the farm of Terence Kelly, where Mr. Ardagh collected specimens of the brown variety.

Thanks are due to the superintendent and the company for hospitality and many kindnesses during our stay.

The total attendance at clasess and lectures was about 35. The average attendance was 23. Complete sets of the specimens with printed descriptive labels were given to a number of men who were unable to attend.

General Electric Mica Mine

Here, as at the feldspar mine, most of the men are drawn from the farms of the district. Many of them spend the nights at home, and some of them board at home. These conditions make it somewhat difficult to get a class together: but, as the interest in mineral development grows, the men are more eager to enlarge their acquaintance with the subject, and are willing to suffer considerable inconvenience in order to do so. The attendance is therefore fairly steady throughout the six days, although broken more or less by change of shifts, early closing on Saturday, and other local causes. Our plan is to accommodate ourselves as well as possible to all circumstances, and to hold the classes at any hour of the day when a body of men can be got together for an hour or two. So on Saturdays, in places like this, where many of the men walk long distances after five o'clock so as to spend Sunday at home, we hold the class at noon. The managers generally prolong the noon hour a little so as to give us a chance. The total attendance here was about 40, and the average 29.

We found this a good locality for collecting pyroxene, apatite, and mica. Some sheets of mica showed a peculiar dichroism.

The manager, Mr. G. W. McNaughton, kindly provided transportation from Sydenham to the mine and return.

Star of the East Gold Mine

It has been known for many years that gold exists in this district, and a considerable number of prospects have been more or less developed. The Star of the East is near Marble lake, about 19 miles north of Kaladar, a station on the C. P. R. west of Sharbot lake. The gold is found in a small quartz vein in crystalline limestone (dolomitic) not far from a contact with a dark Huronian rock, an outcrop of which can be seen about 300 yards northwest of the shaft house, near a little brook. There are streaks of mica

schist (?) in the limestone near the vein, and actinolite is plentiful, as also is iron pyrite. The limestone also carries magnetite, often in well-formed octahedra. Small quantities of copper pyrite were also noticed. Some considerable masses of bismuthinite were obtained, and I heard with pain of larger pieces which had gone through the crusher as "lead." The hoistman, Michael Scullion, an unusually good observer, brought me small specimens of a mineral which I identified as native bismuth. Shows of gold are frequently found in the quartz, to which the bismuth and bismuthinite seem also to be confined. One beautiful specimen of gold was in the form of wire and long flat fibres interlaminated with the green fibres of actinolite. As the actinolite is found mostly in the limestone, this brings the three minerals into close association. The assays show that the gold values extend somewhat into the highly mineralized limestone, but the quartz forms the pay streak. Several specimens of arsenopyrite, copper pyrite and iron pyrite were brought in by the men for identification.

The Star of the East is a model mining camp. The men are drawn largely from the farms of the district, and are bright and mostly well educated. The camp is kept clean, and much credit is due the management for their successful efforts to give the men a civilized life. We appreciated the hospitality extended to us, and enjoyed the unusual luxury of a bedstead and mattress in our tent.

The class for the day shift was held at 6.30 p. m., in the men's sitting room, or out-doors when the weather was favorable. We met the night shift at 4 p. m., and various groups of men at odd times when it was convenient for them. Evening lantern lectures were given in the men's reading room. The total attendance was 32, and the average 26.

Jarman Pyrites Mine

As a class had been held here the previous summer, and as about half of the men at the mine this summer had then attended the class, the attendance was not very large; although some of the men came for the second time. We met at 6 p. m., so as to catch both shifts. Mr. Burnside, the superintendent, gave us much assistance in preparing for the class and in carrying on the work. Total attendance about 25, average 18.

Good specimens of specular iron ore were collected at the old hematite mine on the road to Madoc. A short visit was made to the old Bannockburn gold mine, where a few men were at work pumping out the shaft. A trip was made to the farm of Mr. George Smith, about eight miles north of Bannockburn, where we collected large quantities of tourmaline, barite, and bismuthinite, and incidentally enjoyed the generous hospitality of Mr. and Mrs. Smith.

About a mile northeast of Bannockburn is a vein of quartz highly mineralized with galena, zincblende, iron, and copper pyrites. It has been explored to some depth, but no work has been done on it for several years. The discovery that the iron ore at the Coe mine on the Madoc road passes into copper pyrite, bornite, and copper glance should lead to careful testing of this highly mineralized district as a possible producer of copper. It is significant that the bog iron for which the Jarman mine was first worked gave place to solid iron pyrites with depth. It is quite probable that equally large bodies of copper ore may underlie some of the numerous pyritic and hematite deposits of the district.

Craig Gold Mine

This mine was worked about ten years ago, but abandoned owing to the smallness of the pay streak. Under the management of W. A. Hungerford it was running at the time of our visit on a low grade ore which was being put through a 3-stamp Merrall mill. There were 35 men employed. The class was held in the men's sitting room, at 7 p. m. for the day shift, and at 4.30 p. m. for the night shift. The buildings are well

kept and the dining room was unusually well served. There was here, as observed in all the mining camps of Ontario visited this summer, a vast improvement in the conditions of life as compared with say ten years ago. Sanitary matters are attended to, and intelligent management shows itself in that matter of prime importance in any enterprise where considerable bodies of men are gathered together, viz., their personal comfort. Total attendance 30; average 22.

Craigmont Corundum Mine

The class here was held in Dennison's boarding camp. The large proportion of employees unable to speak English accounts for a somewhat small attendance.

The manager, Mr. D. G. Kerr, kindly provided transportation for the luggage and drove us to points of interest. We visited with him the Burgess corundum mine about 8 miles southwest of Craigmont. Here we found a compact concentrating plant turning out about one ton of clean concentrates a day by a dry process. The working expenses should be small, as the concentration process requires little attention and there were only 7 men working in the mine and on the short tramway by which the ore was brought to the mill.

At Craigmont we collected considerable quantities of corundum and nepheline, as well as molybdenite and garnet. The nepheline can be obtained in any quantity at the west end of the mountain where some corundum rock was taken out last winter.

Total attendance about 40; average 22.

Haileybury

The Orange hall was given us for the occasion, and both class and lectures were conveniently held there. Prospectors came from considerable distances every evening to attend. The minerals with the printed descriptive labels were particularly useful in this district, and there were many requests for complete sets from men who could only attend one evening. A great deal of time was given to this kind of one-man class. It was found possible to give hints of some value as the sets of specimens were being made up. Throughout the day we had calls in our rooms at Gillies' hotel from prospectors with specimens to identify.

On June 28th we drove over to New Liskeard and met Mayor McKelvie with Messrs. Sharpe, Taylor, McEwen and others, with whom we discussed the arrangements for a class at that place. This informal committee undertook to make all preparations for the class. A visit was made to Cobalt on the 29th to arrange for the class there. On the 30th we took the steamer Jubilee to New Liskeard and North Temiskaming. On board the steamer and at the latter place many mineral specimens were identified for prospectors. A trip from New Liskeard to the end of the steel at White River was also rather fruitful in this respect.

Total attendance about 40; average 17.

New Liskeard

The town authorities had engaged the Orange hall as a suitable and convenient place for the class and lectures. The class was held at 7 p. m., and was followed each evening by a lantern lecture on geology. The large attendance taxed our energies to the utmost, as each member of the class received more or less personal attention in the examination and testing of the mineral specimens. Here, as in most places, large numbers of specimens were identified for prospectors, both at the time of the class and during the day. Our room at the Hotel Canada was frequently visited for this purpose. The geological map of the district issued by the Bureau of Mines attracted a good deal

of attention as soon as I posted a copy in the office of the hotel. By the way, this map, so promptly issued, was of immense service to prospectors, as many of them testified. On July 6th Rev. Mr. Pitts and Mr. McCosh took us out to see a new discovery in Hudson township (con. IV., lot 1), showing cobalt bloom, smaltite, niccolite and perhaps bismuth. It occurs in diabase, but from the disturbed condition one would judge that the Huronian is not very far away. That afternoon I attended a meeting held under the auspices of another department of the Ontario Government,—a meeting of farmers to discuss with Professors Zavitz and Reynolds the problems of agriculture as met with in that region. It is interesting to note the similarity of methods used in these two kinds of pioneer educational work,—distribution of specimens or seeds, informal discussions, practical lectures.

The class was closed enthusiastically on July 10th by a vote of thanks, both mover and seconder referring to their appreciation of such instruction furnished by the Bureau of Mines.

Total attendance about 80; average 47.

Cobalt

The class here was held in the tent of the Reading Camp Association, and among the stumps outside. Benches were made by Mr. Douglas Ellis of Kingston, who was in charge of the Association's work. The tent was always crowded, and the overflow stood outside at the doorway. Perhaps the most useful part of the work was done at various times during the day in spotting specimens for anxious prospectors. It was hard to have to tell so many of them that they had not yet found the desired smaltite or other minerals associated with the silver.

Prospecting was very active in the Temiskaming district during the whole summer of 1905. There were about 600 prospectors' licenses issued from the office in Haileybury up to Oct. 31st. Each licensee may be assumed to have had a partner without a license; so that the total number of prospectors may be roughly estimated as 1,200. But not all of these were in the district at one time. Many became discouraged and went out, but many more came in to take their places. As a conservative estimate I would put the number of prospectors in the district on August 1st at 500. They covered the district pretty well, but naturally concentrated considerably around Cobalt. This important centre owes its appropriate name to Professor W. G. Miller. In July, 1905, it consisted of about a dozen log buildings, as many frame houses and stores, and numerous tents, with a population of about 200. Two of the best of the prospects are included in the boundaries of the town plot, viz., J B 6 (Trethewey and Longwell) and the Denison or Buffalo mine. The La Rose or Timmins mine and the lots of the Hudson Bay and Temiskaming Mining Co. are a few minutes walk north and south respectively from Cobalt station. The extensive holdings of the Nipissing Mining Co. begin on the shore of Cobalt lake across from the town and extend eastward. The McKinley and Darragh mine is a few minutes' walk around the south end of the lake. As these are all producing mines, or certain to become so in a short time, it will be seen that the mining population in and quite near Cobalt is already considerable. But the working mines around Giroux, Glen, Kerr, and Cross lakes, about seven in all, are within two miles of Cobalt, which is thus already the centre for some fourteen mines. It must be remembered, too, that these silver veins are producers from the start. It may reasonably be expected then that this, the youngest mining town in Ontario, will grow very rapidly.

The total attendance at Cobalt was hard to estimate, as prospectors were coming and going every day. As a rule each man got a full set of specimens, even if he was present at only one meeting of the class.

Total attendance about 120; average 62.

Giroux Lake

The move from Cobalt to Giroux lake was made very comfortably, thanks to the assistance of Mr. H. E. Savage, whose claim is close to the trail between these two points. We pitched our tent close to the old lumber camps and boarded at Foster's camp. Numbers of prospectors were camped near by. The class was held in the open air, the men sitting on logs in a semicircle. Lectures were given in the old blacksmith shop of the lumber camp, which had the advantage of being easily darkened. All that was necessary was to shut the door. We shared this place with the fire ranger of that beat, who was out of work, as it rained every day.

Here we were within easy range of a number of camps,—Foster's, Lawson's, Jacobs', Hargrave's, Glendinning's, Drummond's and Handy's. Under the guidance of Mr. J. G. McMillan, my associate of a former summer, all these camps were visited, and the men were invited to attend the class.

On July 20th we had a visit from Mr. Glendinning, who invited us to his camp where a number of School of Practical Science men were engaged in developing a rich silver property. There we had dinner, and then completed the round by taking the north trail to Cobalt. On the way we overtook Mr. Derry, mine superintendent of the Superior copper mine, and Mr. Boyer, discoverer of the Helen mine. This is mentioned to show how attractive this district is becoming. In Cobalt we met Mr. Alfred Fitzpatrick, of the Reading Camp Association, who was accompanied by Rev. Ferguson Millar. These gentlemen went with us back to Giroux lake and spent the night there and the next day.

Here, as in Cobalt, the work of examining specimens for prospectors was very important and sometimes exacting. Numbers of the prospectors were shown how to distinguish between smaltite and pale iron pyrites by a simple test in a closed tube. As the iron pyrites in this district is often almost white, this distinction is important. We also suggested panning the dirt from likely-loking veins, so as to find any small nuggets of native silver or silver glance. As the amount to be looked for is relatively large, a rough panning in a deep plate or any handy dish is all that is necessary. If the apparatus and chemicals are available, the concentrates may be dissolved in nitric acid and tested for silver with hydrochloric acid.

Fine specimens of native bismuth were being taken out at Foster's mine, and here as at the other mines visited, the owners were generous in giving good specimens to those likely to value them for scientific purposes.

Total attendance about 70; average 31.

An unusual characteristic of the Cobalt district is the large number of college men who have made discoveries. Another is the large number of owners. The immense wealth of these deposits is to be distributed to the many. There was danger at one time that it would be nearly all swallowed up by one or two large companies; but, as a result of vigilance on the part of the authorities, this has been prevented. The distribution of wealth is one of the most serious problems of political economy. In this case the government has taken for its guiding principle,—to secure by its regulations at the very beginning the greatest possible amount of distribution. Surely this is desirable. These silver deposits are largely treasure trove. The cost of production is in most cases insignificant as compared with the value of the ore. It is better for the country if such treasure is well distributed.

Shakespeare Gold Mine

This mine is about four miles from Webbwood, a station on the Sault branch of the C. P. R. We were warmly welcomed by the manager, Mr. Wm. Wood, and by the mill foreman, Mr. G. Vary, an old friend. It was late in the afternoon when we arrived.

but we had many helpers and were able to get the tent pitched and everything ready for opening the class, which was held out-doors in front of the sleeping camp. The hours were as usual, but an extra lantern lecture was arranged for the night shift. Many of the men working at this mine were drawn from the farms of the district.

We desire to thank the manager and his staff for many kindnesses which helped to make our stay pleasant.

Total attendance about 40; average 25.

General

The total number who received instruction in these classes was about 550, nearly all of whom got sets of 40 specimens. This implies the preparation and distribution of over 20,000 mineral specimens with descriptive printed labels. In addition to these, numerous sets were made up and sent to persons who had heard of them and who wished to get a set for use in prospecting. That good work is being done in this way is proved by letters of thanks and other references to the practical usefulness of the specimens. For example, one writer says, "You will be interested to learn that the samples of minerals and descriptions and value of same you so kindly sent me a short time ago have already been of service. I interested a representative of a mining company in molybdenum properties I had got trace of * * *."

It is my duty to direct attention again to the alarming amount of illiteracy in some of our settled districts. This is shown by the fact that at some mines fully half of the men cannot sign the pay roll. These are mostly, too, natives of the district in which they work. If these illiterate men were all middle aged it might be hoped that they were a product of conditions from which the Province has emerged; but many of them are young,—some, indeed, mere lads. Here is certainly a subject for inquiry by the Education Department. Are the school facilities in the sparsely settled parts of the Province the best that can be devised for the conditions prevailing there? Can anything be done to improve matters by consolidation of small schools into larger ones and providing transportation for the children; or by Provincial assistance to outlying communities so small that they cannot support a good school or any school at all?

MINES OF ONTARIO

BY E. T. CORKILL

This report embraces all the working mines of Ontario, and for greater explicitness the Province will be divided into four sections:

(1) Northwestern Ontario, embracing all that region north and west of Port Arthur.

(2) Sudbury and the North Shore, which includes the section from Sudbury west along the line of the Sault Branch of the Canadian Pacific railway, and the Michicoten District.

(3) Temiskaming district, which embraces all that part of the district of Nipissing through which the Temiskaming and Northern Ontario railway extends, including the Cobalt region.

(4) Eastern Ontario, including all of Ontario lying south of that part of the Canadian Pacific railway which stretches from the Ottawa river to the northern part of Georgian bay.

In Northwestern Ontario the mining industry has until the last year depended largely on the gold mines. During the latter part of 1905 and the present year work has been started on a large scale at the Atikokan iron mine, on which considerable exploratory work had previously been done. This, together with the erection of a smelter for the treatment of these ores at Port Arthur, should act as an incentive to the thorough exploration of the iron ore bodies of Western Ontario. The building of the National Transcontinental railway should also open up a section to the north of the Canadian Pacific railway which has previously been inaccessible for mining, especially in the vicinity of Sturgeon lake, lake Minnetakie and lake Nepigon. Near lake Minnetakie an iron pyrites deposit is being developed. This will depend altogether on the National Transcontinental railway for shipment of the ore, as the present condition of the market will not allow its being hauled a very great distance to the railway.

In the Manitou country the rich find of gold at the Laurentian mine caused a revival of interest in that section. On Lake of the Woods and Eagle lake a few properties are working, chief among these being the Sultana, where ore is being taken from the Crown Reef vein and milled. At Sturgeon lake the St. Anthony Gold Mining Company have put in a mill and are running steadily.

In the Sudbury and North Shore district the nickel industry is still expanding. The year 1905 saw the largest production of nickel up to that time. With the installation of their new smelter in 1903 and its completion in the fall of 1904 the Canadian Copper Company were enabled to handle a very large tonnage of ore, which for the last year has been obtained altogether from the Creighton and No. 2 mines.

The Victoria Mines, the property of the Mond Nickel Company, were in operation all year, adding considerably to the total production of nickel

A plant for treating the Cobalt ores was erected in 1905 at Copper Cliff, a description of which will be found in another part of this report.

The Bruce Mines, which were the first copper mines to be worked in the Province, have been taken over by a new company, and work has again been begun. At Michipicoten the Helen mine still yields largely, being the largest iron producer of the Province. Considerable of this ore is shipped to the United States.

The greatest activity in mining in the Province during 1905 and the present year has been in the Temiskaming district, especially in the vicinity of Cobalt. One of the most remarkable features about the camp is its large number of producing mines in so small an area, there being at least twenty properties that have shipped ore or are in position to do so, within an area of about six square miles. The camp is undergoing this year what is known in mining parlance as a "boom." A number of stock companies have been floated on doubtful or worthless claims, which they represent to be very promising, and their stock has been peddled out to the public. By these methods a wrong impression is given of the mining industry; in fact, a great many people consider mining only a gamble, and act accordingly. This belief should certainly be discouraged, as mining, if carried on properly, is as legitimate a business as any other. The mine owners of Cobalt who for the first year or so showed the public by their method of mining, namely open cutting, that their faith in the depth of their veins was very small, have begun to develop their properties systematically,thus showing that the veins are extending in depth beyond their first expectations. Two important discoveries of smaltite and silver on the northwest quarter of the north half of lot one in the third concession of Coleman show the mineralized belt to be wider than was formerly thought. Also, the discovery of smaltite in Casey township and the Portage Bay section shows this mineral to be more widely spread than the silver-bearing ores. There are a large number of small prospects on which a great deal of work has been done in the Cobalt district which have not been mentioned. Only the more important of the prospects are described in this report along with the shipping mines

The fatal accidents that occurred underground during 1905 resulted chiefly either from careless handling of dynamite or from riding in buckets. The practice of companies posting notices at the mouth of the shaft, forbidding their employees riding in the bucket and then not endeavoring to enforce that rule, does not render the employer free from blame in case of accidents.

There is considerable difficulty in selecting locations for dynamite magazines in the Cobalt district, owing to the danger from forest fires, and the network of veins on various properties.

It is also necessary to call the mine owners' attention to the Mines Act 1906, whereby no building is allowed within 50 feet of the shaft house.

I.—Northwestern Ontario

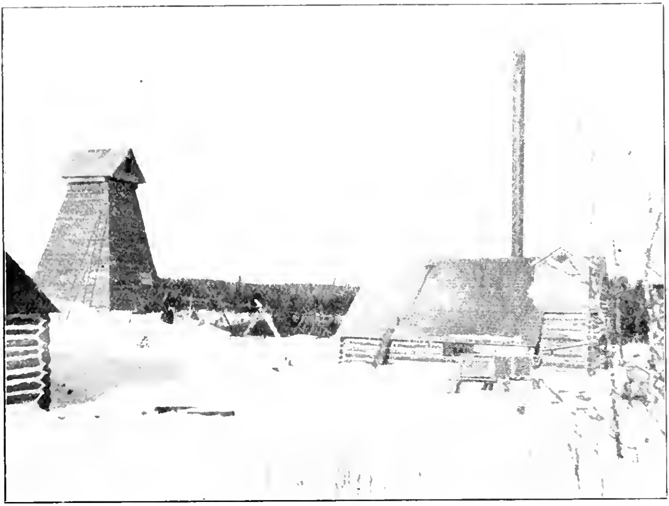
GOLD MINES

The working gold mines of Northwestern Ontario may be briefly described as follows:

Minto Mine or A L 200

This property is reached by canoe route and portage from the Hospital on the Canadian Northern railway ,about 140 miles west of Port Arthur, and about three miles north of the Atikokan iron mine. Some work was done in 1903, but during 1904 very little was accomplished. The next year saw some further activity, when a stamp mill was purchased and hauled in, and boiler, compressor and hoist installed.

The property is now owned by the Reading Mining Company of Buffalo, with H. J. Thorle as manager, and John McLean, superintendent. A gang of 8 men were employed hauling out wood and timber.



Minto gold mine, Rainy River district.

Minto gold mine ; camp buildings.

A shaft 7 by 9 feet has been sunk to a total depth of 60 feet, close cribbed for about 24 feet and ladder way partitioned off from the hoisting compartment. About half a mile northeast of the shaft the quartz ledge outcrops for about 300 feet. Considerable stripping has been done here, and the stamp mill is about to be erected.

During the past year a three-drill air compressor, Jenckes tubular boiler and a 20-inch drum double-cylinder hoist were installed, also pump and drill in the mine. An office building, boarding house and bunk house, have been built at the camp and dry, boiler house, blacksmith shop and shaft house at the mine.

Sunbeam or A L 282

This property remained idle last year. From the late superintendent Thos. R Jones, I learned that work ceased about the first of 1905. The extent to which the property was developed is fully described in the Fourteenth Report of the Bureau of Mines.

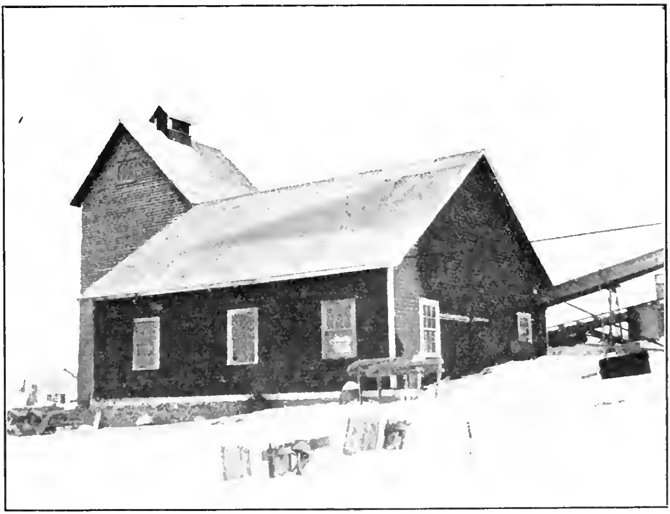
Laurentian Mine

In the Manitou district the Laurentian mine, comprising mining location H P 371, of 52 acres extent, is situated about one half mile northeast of Gold Rock, at the head of Upper Manitou lake, some 20 miles south of Wabigoon. The owner is Anthony Blum of Boston, Mass., with Dryden Smith as mine superintendent, employing a force of 25 men, of whom 12 are working underground.

Laurentian gold mine, H P 371.

Mining operations began in October 1903, but work was suspended for part of last year pending a transfer of the property to the present owner from the Laurentian Mining Company. A strike of very rich ore on the first level about the first of the year has caused renewed interest to be taken in the surrounding district as well as in this particular property.

The shaft has been sunk to a depth of 271 feet, an increase of 51 feet since last inspection. The first level is at a depth of 80 feet, with drifts north 114 feet, and south 43 feet from the shaft. On this level cross-cuts have been run, at a distance of 80 feet north of shaft 31 feet west, and 13 feet north of shaft cross-cut east 17 feet. Rich ore was struck on this level 15 feet north of the shaft, and also at 40 feet. In the south drift cross-cut a No. 9 Cameron pump is placed, pumping water from this level and also the water pumped from level below, to surface. The second level at a depth of 200 feet has a drift run north of shaft 89 feet. At 18 feet north from shaft, cross-cuts are being run east and west, having now attained a distance of 135 and 116 feet respectively. The west cross-cut is being driven to cut the Trudo vein 225 feet west of the shaft, which was cut by a diamond drill hole at depth of 400 feet. The east cross-cut is being driven to intercept a 20-foot vein of quartz located by the diamond drill on the first level 380 feet east of shaft. Another cross-cut was driven west 20 feet on this level at 84 feet north of shaft.



Shaft and hoist house, Laurentian gold mine.

The 20-stamp mill used at the Twentieth Century mine has been brought to the Laurentian mine, and was put into operation in May 1906. The mill is about 600 feet east of the shaft on the west slope of the hill. A trestle has been constructed from the shaft to the mill, and ore is hauled by skip operated from the hoist house. Water for milling purposes is brought from a lake about a quarter of a mile north of the property.

In addition to the stamp mill the high pressure half of a 12-drill Ingersoll-Sergeant duplex air compressor has been installed, and a double drum hoist, one drum being used for hoisting from the mine to the mill. In the boiler house a battery of three 50-h.p. Scotch return tubular boilers covered with asbestos, using feed water heater, supply steam for the plant.

Instructions were given regarding ladders in the shaft and prohibiting men riding in buckets.

The rich ore encountered on the first level occurs on the foot wall as a narrow vein of quartz and free gold. The free gold in some parts predominates. The vein here occurs in the greenstone of Keewatin age.

A road has been cut through by Mr. Blum from the mine to Dinorwic, making an all-land route with the exception of the Wabigoon river crossing.

Big Master

This property resumed work in April 1905, after having been idle for over a year, under the ownership of the Big Master Mining Company, with Benj. Hammond, president, and W. Shovells, superintendent. The head office of the Company is at Fishkill-on-Hudson, N. Y. From that time until January 4th 1906, the property was worked continuously, when it was again closed down.

During this time the shaft was sunk 100 feet to a total depth of 285 feet. No work was done on the first and second levels. On the third level a drift was run northeast 110 feet and a raise put through to the second level. A cross-cut was also driven east on this level 215 feet to cut the vein which outcrops east of the old vein. Work, however ceased before the vein was reached.

The mill, which is of 10 stamps, was run for 83 days, producing $9,800 worth of gold. The ore for this mill run was stoped from between the second and third levels.

Little Master

The Little Master mine, owned by the Summit Lake Gold Mining Company, has been closed for the last year and a half. Very little work was done subsequent to the last inspection. Accordingly, the development as recorded in the last Report brings the record up to the present. Last winter some 800 cords of wood were got out in preparation for active work.

Pay Master

This property, comprising mining location H W 20, of 83 acres area, is about half a mile east of Gold Rock, and adjoins the Big Master. It is owned by the Northern Development Company, whose offices are at 1005 Majestic Building, Detroit, Mich Mr. R. J. Elliott is superintendent, and was at the time of my inspection, 20th February 1906, engaged in installing a new boiler and compressor plant. This plant consisted of a 65-h.p. boiler, a duplex cylinder hoist, and half of a 12-drill air compressor manufactured by the Allis-Chalmers-Bullock Company. During the summer of 1905 the mine was worked, and a shaft 7 by 9 feet sunk to a depth of 200 feet, being an increase of 100 feet.

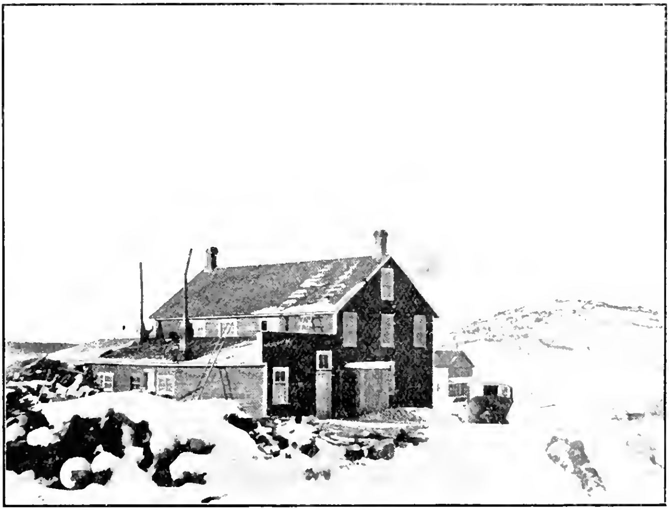
As shown in last year's Report, there are two parallel lenticular quartz veins about 30 feet apart on the surface, dipping a few degrees to the southeast, with strike about northeast by southwest. A cross-cut was run on the 100-foot level a distance of 18 feet and on the 200-foot level a distance of 23 feet to cut the ore body. On the 200-foot level the number 2 vein is, according to the superintendent, 11 feet wide.

The attention of the superintendent was drawn to the danger from fire by placing the boiler and compressor house so close to the shaft house.

Gold Rock Mine

The Gold Rock locations, owned by the Gold Rock Mining and Milling Company, consist of H P 405 and 407, the work at present being done on the former. Location H P 405 adjoins the Big Master on the southeast. Three shafts have been

sunk having depths of 50 feet, 50 feet, and 135 feet respectively. In 1905 work was carried on for about five months in the deepest one. At the time of inspection a drift was being made into the hill on the shore of Selby lake. The outcrop of the vein



Gold Rock, Upper Manitou lake.

on the hill is about 80 feet above the bottom of the drift, which is in 135 feet. A shaft 56 feet deep has been sunk on the vein some 800 feet southwest of the tunnel.

A Lidgerwood hoist and 20-h.p. boiler are being used in the development work.

EAGLE LAKE DISTRICT

The Eagle Lake district is reached in the summer by steamer from Vermilion Bay, a station on the main line of the Canadian Pacific railway, while in the winter the shortest route is from Eagle River, a station some miles east of Vermilion. No marked change has been noted in this area since last inspection.

Eldorado Mine

This property is now owned by the Eldorado Mining Company, with S. S. Forneri as superintendent. Work began in October 1905, after having been suspended the greater part of the year. A force of nine men is now employed in development and exploration. The shaft has been sunk to a depth of 140 feet, an increase of 55 feet, and a ladder way put in, divided from hoist-way to first level at a depth of 65 feet. On this level a drift has been run northeast a distance of 100 feet. The second level at depth of 120 feet has a drift northeast 25 feet in length.

The 2-stamp mill on the property described in previous reports was at the time of inspection being used in a test run on ore that was being taken out in the development work.

Baden-Powell

Work at this mine ceased temporarily in January of the present year owing to inadequate fuel supply. The shaft has now reached a depth of 140 feet, being an increase of about 40 feet. The first level at a depth of 60 feet has a drift run east 112 feet and west 17 feet. No drifting has been done on the second level.

The 5-stamp mill has been completed, with assay plant in connection. A 40-h.p. boiler and 3-drill air compressor has been installed. The property is owned by the Northern Light Mining Company, who also own half the stock in the Eldorado Mining Company. Mr. S. S. Forneri is superintendent for the company.

Eldorado gold mine, Eagle lake.

Pioneer Island

This property was worked during the first part of 1905 and the shaft sunk to a depth of 80 feet. It is owned by the Northern Light Mining Company. A description of the deposit is given in the last Report of the Bureau of Mines.

Grace Mine

Work was resumed here in December 1905, but unfortunately had to close again in February of the present year. The shaft was deepened about 10 feet, giving it a depth of about 65 feet. The tunnel some quarter of a mile from the shaft has been driven 100 feet.

During the time of operation a new gallows frame was put up over the shaft, and an 85-h.p. boiler, and a 14-h.p. hoist were installed. The boiler house is 300 feet from the shaft. A 10-stamp mill has been purchased, and is at Vermilion Bay ready for transportation to the mine. A force of 12 men were employed by Mr. J. H. Casler, manager for the owners, the Grace Mining Company.

Golden Eagle

This property was not in operation during 1905, but from the manager, Mr. N. Higbee, it is learned that the shaft has been sunk to a depth of 70 feet and 160 feet of drifting done. The property is in proximity to other mines on Eagle lake.

Ideal Gold Mine

The Ideal mine is situated in Van Horne township, about 6 miles south of Dryden station on the main line of the Canadian Pacific railway, about 80 miles east of Kenora. It is owned by the Ideal Gold Mining Company of Baltimore, with Mr Buxton as manager. Since the re-opening of the property a drift has been run north from the bottom of the shaft, which has a depth of 89 feet, a distance of 20 feet. The shaft, 7 by 12 feet, is closely cribbed to a depth of 35 feet, but has no suitable ladder way or dividing timbers. Instructions were left regarding this matter. Trenching has been done on the surface, and two veins uncovered, both having a strike east and west. The shaft has been sunk between the two veins, and cross cutting is being done on the 85-foot level to encounter them.

An experimental stamp mill called the Chas. Wallace improved stamp mill has been put in, having a capacity of 5 tons per 24 hours. This mill combines both the crushing and grinding effect. The plates are narrow, and arranged in series, making in all about 8 feet of plates over which the pulp has to pass. Some of the ore treated has been roasted, which according to Mr. Buxton, greatly increases the capacity of the mill.

The outcrop of the vein is 87 feet above the lake, and a site has been cleared here for a stamp mill to be erected as soon as the property warrants it. A force of 10 men were employed. Instructions were given regarding handling of explosives.

Redeemer Mine

This mine, which was in operation during part of 1905, was closed at the time of my visit. It is owned by the Redeemer Mining Company, Gus. Larson being superintendent. The shaft has not been deepened, but about 100 feet of drifting has been done on the first level. No drifting on the second level. About 200 tons of ore was milled during last year. Since the time of inspection work has been resumed.*

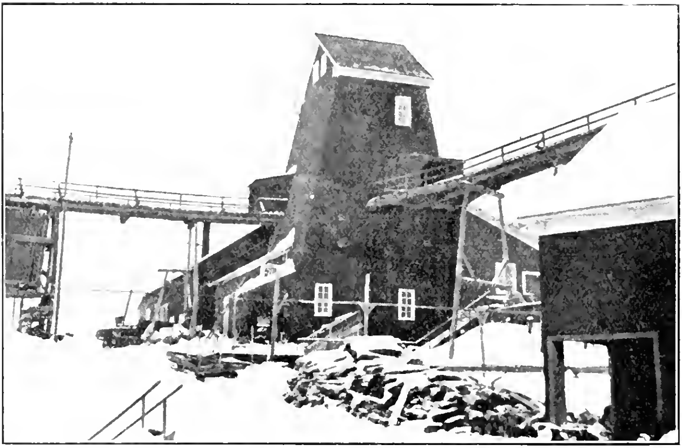
The plant consists of a 3-drill air compressor, two boilers, 35- and 40-h.p. capacity, respectively, and a small hoist. The 10-stamp mill has been completed and cyanide plant capable of handling output of 5 stamps put in.

Mining Location E D B I

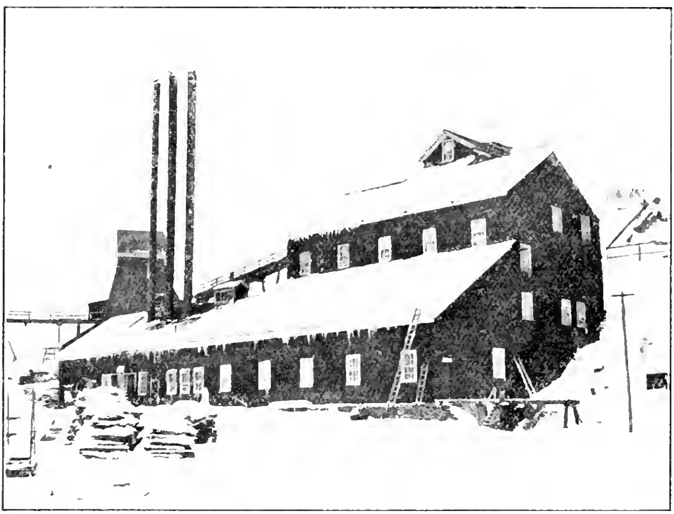
About six miles south of Dryden Mr. Holmes is prospecting on the above location for a company from Minnesota. A shaft has been sunk 20 feet.

LAKE OF THE WOODS DISTRICT

In Lake of the Woods field two of the pioneer mines were in operation last year, namely the Sultana and Regina. The former is still working, but unfortunately the Regina had to close down in the early part of the year, owing, according to the manager, to financial difficulties. Two other properties on Lake of the Woods, the Bully Boy and Combined, were doing development work, while on Shoal Lake the Olympia and Golden Horn are the only properties being operated.



Sultana gold mine; shalt house.



Sultana gold mine; stamp mill.

Sultana Mine

Under the management of Mr. J. F. Caldwell, this property has been running steadily for the past couple of years and obtaining fair results. The shaft during 1905 was sunk 40 feet, making a total depth of the main shaft of 600 feet. At the time of my inspection, however, it was full of water up to a point between the fourth and fifth levels. The work was all being done on the Crown Reef vein, which is reached by a drift 750 feet south of the main shaft, being an increase of 250 feet, on the second level. A winze has been sunk from the second level to connect with raise from the fourth level, a distance of 140 feet. The stope between the second and fourth levels is worked, the ore being trammed from a chute on the fourth level.

The drift of the Crown Reef vein on the fourth level is 750 feet in length to connect with ore body discovered on the second. All waste rock is being used to fill up the old stopes in the main part of the mine.

The mill is running steadily, 15 to 20 stamps being in use. A force of 20 men are employed under superintendent Mr. J. Johnston.

Regina gold mine, Lake of the Woods.

Regina or Black Eagle Mine

This is one of the oldest and most widely known mines on Lake of the Woods. In 1901 it was transferred from the Regina Gold Mine, Limited, to the Black Eagle Gold Mining Company, Limited, with head office at College Street Chambers, Canning street, London. It was re-opened in 1905, after having been closed for two or three years, and worked for some months. Owing to lack of money for development, work at the mine ceased on the first of February of the present year.

During the period of activity the shaft was scaled thoroughly and sunk 30 feet to a depth of 550 feet. From the first level an adit was driven 80 feet to furnish a

means of egress from the mine. This adit comes out in the old Tremain mill. On the fourth level the south drift was driven about 75 feet, making a total of 457 feet. A winze was sunk on the third level south drift about 30 feet, and a raise from fourth to connect with it of about 15 feet. On the ninth level south drifts stulls were put in and some ore broken down. The other levels remained unchanged.

On the surface the head frame of the shaft house was raised 30 feet, and a new tramway built to the mill. The ore is now dumped from buckets over grizzlies to the crusher. The fines from the grizzlies are trammed to the shaft, and from the crusher are carried by travelling belt.

During the summer of 1905 some ore was run through the mill, giving a fair result. The mill is equipped with 30 gravity stamps, 1050 pounds, arranged in batteries of 10 stamps. Concentrating is done by four Wilfley tables. There are also in place three cyanide tanks of 20 to 30 tons capacity each. A cage has been purchased for use in the shaft, but has not been put in. The ore occurs in a contact between the slate and granite. The contact dips at an angle of about 50 degrees, cutting across the shaft at about the fourth or fifth level, thus throwing the ore body to the east side of the shaft. About 20 men were employed under the management of Lieutenant-Colonel Sir Henry Wilkinson.

Bully Boy Mine

This mine, which has lain idle for some time, has been acquired by the Arizona Camp Bay Mining and Milling Company, whose head office is in Detroit, Michigan. Work begun in July 1905. The president of the company is Albert Strelow, and the superintendent Fred. Pfau. The property comprises mining locations S 56, 57, 92 and D 240. The shaft is being sunk on S 56 and is about half a mile northeast of Camp bay and north of the mill belonging to the Camp Bay Mining Company.

The shaft which had previously been sunk to a depth of 140 feet, has been continued to the 200-foot level and drifting has begun on the vein in each direction. Hoisting is done by bucket sliding on skids. The hoist-way is separated from the ladder-way.

The machinery consists of two 45-h.p. locomotive firing boilers, a Jenckes double cylinder 2½-foot drum hoist, and an 8-drill duplex Rand air compressor. The compressor was taken from the Boulder mine. During the year, shaft, engine and boiler house were built, as well as camp buildings. Attention was called to the danger from fire of having all buildings under the same roof as the shaft house. A force of 7 to 10 men is employed. The vein has a strike northeast by southwest, and is enclosed in a schistose rock of Keewatin age. The contact between the granite and Keewatin occurs about 20 chains northwest of the shaft. A diorite dyke is found about one mile northeast of the shaft, cutting the formation normal to the contact.

Combined Mine

Mining was begun on this property, which is situated about two miles from Camp bay, in July 1905, after having been closed from February 1904. The new owners are the Camp Bay Mining Company of Buffalo. Mr. Blaksley is the president, and George Thurber, superintendent. The former superintendent, Mr. S. Pinchin, met his death through drowning last summer.

On resuming mining operations, a new shaft was commenced 150 feet northeast of the old shaft, which has not been unwatered. This new shaft has been sunk about 45 feet, and drifts run north, south, east and west on the vein which is here nearly horizontal and varies in width from two to six feet. The north drift has been run about 40 feet, south drift 60 feet, east drift 50 feet and west drift to connect with the old workings. The vein has been stoped out south and west of the shaft. Where

the ore has been stoped out timbers have been put in every five to ten feet to support the roof. In the fall of 1904 machinery was installed, but was not in use until July 1905. This consisted of one 70-h.p. and one 30-h.p. locomotive firing boiler, a 1-drill duplex cylinder Ingersoll-Sergeant air compressor and double cylinder hoist.

The 10-stamp mill belonging to the company is situated on Camp bay, about two miles from the mine. A narrow gauge railroad runs from the mill to the foot of the hill near the mine. The ore is drawn by horse and car from the mine, a distance of about 500 yards to an ore shoot and bins, where it is loaded on cars and hauled by a small 10-ton locomotive to the mill. The mill was in operation for a short time in the fall of 1905. A force of 20 men are employed.

Golden Horn

In the Shoal lake district only two properties were operated last year. These were the Golden Horn and the Olympia.

The Golden Horn at the time of my inspection was closed down, but I obtained the following information regarding it from Mr. Rideout of Kenora. The property comprises mining location D 288, of 63 acres area, the owners being the Rush Bay Golden Horn Mining Company, Limited, of St. John, N. B.

No. 1 shaft has been sunk to a depth of 255 feet, and 175 feet of drifting has been done in both directions on the vein on the first level. On the third level a cross-cut has been driven south 285 feet. No. 2 shaft is 113 feet deep on vein 84 feet south of No. 1 vein.

The machinery, which consists of a 2-stamp Merrall mill, was described in the last Report of the Bureau of Mines. Last year a small tonnage of ore was run through it.

Olympia Mine

This property is owned by the Olympia Mining Company, with George H. Vernon of St. Paul, Minnesota, manager. It was not in operation at the time of my inspection. Preparations were however being made to begin extensive work in the spring.

St. Anthony Reef

This mine, situated on Sturgeon lake, some 75 miles north of Ignace on the main line of the Canadian Pacific railway, has been transferred from the Jack Lake Gold Mining Company to the present operating company, of which Mr Arthur Hill of Saginaw is president, and Mr. McCuan, manager.

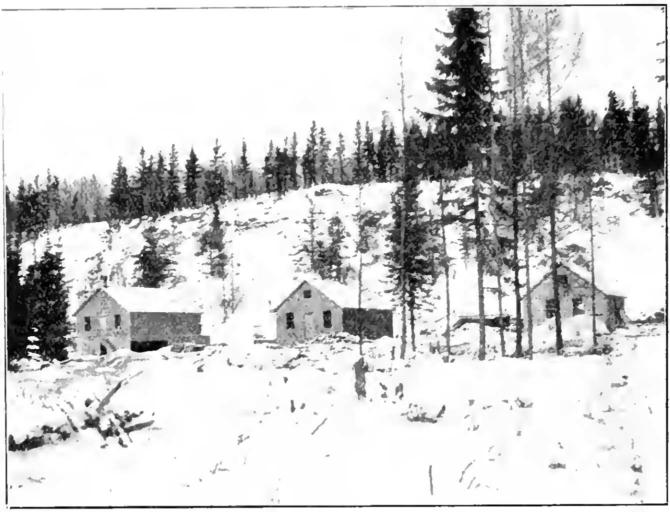
Owing to the difficulty of access, no inspection of this property was made last year. From the management it is learned, however, that both the mine and mill have operated steadily with good results.

Atikokan Iron Mine

Considerable interest has been manifested in the iron properties near Port Arthur during the past year, especially on the Atikokan range. Mining locations 10 E, 11 E, and 12 E have been acquired by the Atikokan Iron Company, with William McKenzie, president, and J. C. Hunter of Duluth, vice-president and general manager. This company have entered into an agreement with the town of Port Arthur, whereby they agree to put up large roasting and smelting works, employing 200 to 300 hands, in return for certain concessions from the town in the way of site and cash bonus.

At the mine a great deal of work was accomplished during the past winter, building boarding houses, store house, etc., installing a large plant, and making general preparations for shipping a heavy tonnage from the mine.

The range in which the ore is found occurs as a steep narrow hill of green schist interbedded with lenses of magnetite. A tunnel 288 feet long has been driven completely through the hill, disclosing ore in three separate places having widths of 44 feet, 10 feet and 16 feet respectively, the section being described in the Eleventh Report of the Bureau of Mines. The ore is a magnetite, partly coarse and partly fine grained. The magnetite in some parts is associated with pyrrhotite to such an extent that the ore must be roasted before smelting. The ore lenses run somewhat east and south of west, and are nearly vertical. The rocks enclosing the ore bodies belong to the Keewatin, and consist partly of hornblende chlorite schist, and partly of massive

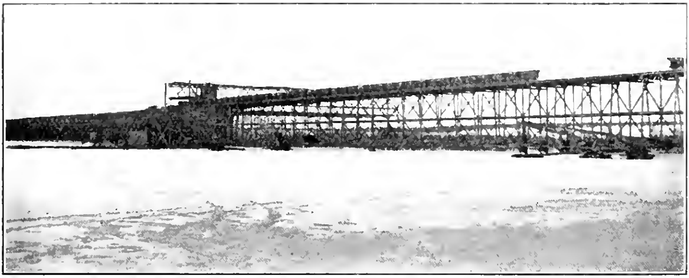


Atikokan iron mine ; camp buildings.

pyroxenite. Under superintendent J. G. Harris the plant was installed during the last winter consisting of three 100-h.p. tubular boilers, a Rand air compressor "B-3" having steam pressure 125 pounds, air pressure 80 and 100 pounds, and a capacity of 2672 cubic feet of free air per minute. Only the high pressure half of the compressor is being put in at present. Two No. 6 Austin gyratory crushers are being installed. The ore is to be brought from the tunnel, which has 80 feet of ore above it, in 2-ton cars and dumped direct into the crusher. It is then hoisted by belt and bucket conveyor and dumped on screens which lead to ore bins built directly over the railway track. A spur is being put in from the Canadian Northern between Kawene and the Hospital siding to the mine, a distance of over 4 miles. In addition to the power plant, store houses have been built and a boarding house and bunk house to accommodate about 100 men.

At Port Arthur the work of building the roasting furnaces and smelter is being rushed forward to completion. The site of these works is west of the Canadian Northern elevators on the water front, and has a frontage of 1800 feet by depth of 3000

feet. On the eastern side are the coal docks and pockets, on the western side the blast furnace, and midway between, the coking furnace. The roasting furnace is to have a capacity of 500 tons per day. Ore containing about .75 per cent. sulphur will require about 27 hours to roast, using furnace gases as fuel. The machinery for the blast furnace has a capacity for handling 200 tons of ore per day, but linings are being only put in at present for 100 tons. All foundations are of piles filled in with concrete. The charging floor for the ore, limestone, coke, etc., is from a trestle running from the shore. The company expect to employ about 400 men at the mine and furnace. The superintendent of the smelter is Mr. R. R. Jones.



Atikokan Iron Company's coal dock, Port Arthur.

Shilton Sulphur Mine

On lake Minnetakie, Mr. E. R. Michie of Dinorwic has been developing a deposit of iron pyrites during the past year. At the time of my visit operations had ceased, owing to the management's decision to put in machinery before further work was done. Access to this property is obtained by means of a road 9 miles in length from Dinorwic to Sandy lake, thence by canoe across Sandy lake and a 15-chain portage to lake Minnetakie. A shaft has been put down to a depth of 125 feet. Shipping ore from this mine will be by means of the National Transcontinental or Grand Trunk Pacific railway, from the proposed line of which the mine lies only a few miles distant.

Tip-Top Copper Mine

The Tip-top copper mine, which has been quite fully described in former reports of the Bureau, has been working very little during the last year or so. At the time of my inspection Mr. Sandow, the foreman, had 6 men employed prospecting, sinking test-pits and trenching. No work has been done in the shaft. Colonel Ray is the present owner of the property

II.—Sudbury and the North Shore

WATER POWER DEVELOPMENTS

The nickel-copper industry has during the last year been in the most healthy condition in its history. With the development of the mines, the demand for cheap power becomes most imperative. As a result the Canadian Copper Company, under

a subsidiary company known as the Huronian Company, have installed a plant at High Falls on the Spanish river, where a head of nearly 90 feet is obtained, and a present capacity of about 7,000 h.p. The water is diverted from the natural course by a series of concrete dams, to two nine-foot penstocks through which it runs to the turbines, each turbine having a capacity of 3,550 h.p. The generators, which are directly connected with the turbines, are 2,600 KW. 2,200 volt, 3-phase, with stationary armatures. The current is run into two banks of transformers of three each, by which the voltage is raised up to 35,000 volts for transmission over the line to Copper Cliff, where similar transformers step it down to 2,200 volts part of which is again reduced for lighting purposes. These transformers are oil and water cooled.

The switch board is of the most modern make, and was installed by the Westinghouse Electric and Manufacturing Company. It consists of five panels and is of the desk type. The instruments are placed in three pedestals in front of the board, and the arrangement of the whole is such that the operator standing at the board is able to see all the signal lamps, the instruments and machines without moving from his position. The switches are all equipped with over-load relays, and are situated in a tower back of the operator, from which they are all operated by direct current trip coils, by which means perfect safety is assured to the operator, as there is nothing higher than 110 volts at the board.

The transmission line is about 30 miles long and consists of 6 bare copper wires (No. 1), strung for the whole distance on sets of poles, two and two, 130 feet apart.

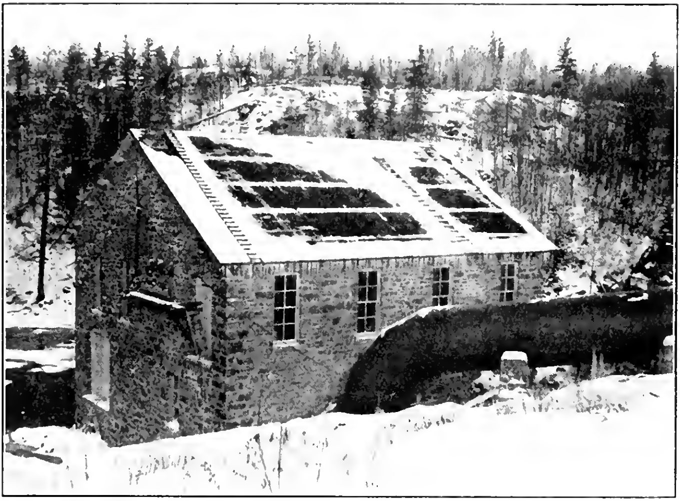
The wheels were made by the I. P. Morris Company of Philadelphia, the generators by the Crocker Wheeler Company of Ampere, New Jersey, and the governors by the Sturgess Governor Company of Troy, New York.

The total available capacity of the plant is 14,000 h.p., of which half is at present developed.

Another water power has been developed at McPherson's Falls on the Vermilion river on lot 11, concessions 1 and 2, Creighton township, about 16 miles west of Sudbury, for the sale of electric power, by the Sudbury Power Company, Mr. J. J Turriff of Ottawa being president. The natural head of the water power at the falls is 17 feet, and the artificial head 24 feet. There is power capable of developing 5,000 h.p. The power house is built of stone, and the dam of timber filled in with stone. A 1,000-K.W generator manufactured by the Allis-Chalmers-Bullock Company has been installed. The voltage is raised by transformer to 22,000 volts before being transmitted. The generator is coupled direct to four horizontal water wheels of the Samson Leffel pattern. There are also two 75-K.W. exciters, each driven by a separate pair of wheels, and each pair of wheels is coupled direct in its own flume. The tail races are 12 by 20 feet in section, and are cut out of the solid rock.

Another power plant was begun in November 1904, and completed last year. This is owned by the Wahnapitae Power Company, and is located about 2½ miles southwest of Wahnapitae on the river of that name. The power plant is about 18 miles from the lake of the same name, which is 10 by 12 miles in area. The dam is built of timbers bolted to the rock bottom and to each other, with interstices between timber filled in with rock. It has a height of 35 feet, and a width of 200 to 250 feet. The forebay, which is south of the dam, is 300 feet in length, and its walls are of stone and cement. The dam at the end of the forebay is 25 feet in height, 15 feet thick at the bottom and about 6 feet at the top. The flume, from the forebay to the power house is 10 feet in diameter and 163 feet long. Three additional openings are left in the dam for increasing the capacity of the plant, which would thus have a total capacity of 5,000 to 6,000 h.p. The total height of the fall is 56 feet. The tail race is 20 to 25 feet deep, and 22 feet wide, cut out of solid rock. The turbine manufactured by the Jenckes Machine Company of 1,600-h.p. capacity is directly connected with an alternating

current, 60-cycle generator, which develops 800 K.W., or about 1,200 h.p. Space has been left in the power house for another unit of equal capacity, all that is required being the flume, turbine and generators. Two transformers raise the voltage from



Power House, Wahnapitae Power Company.

2,300 to 23,500 volts for transmission over the line. Power is at present being transmitted to Sudbury, a distance of 9 miles, by triple-phase transmission wire (No. 4). A transformer at Sudbury reduces the voltage to 110 or thereabouts for lighting purposes.

CANADIAN COPPER COMPANY

A very complete account of this company's operations is given in part III of the Fourteenth Report of the Bureau of Mines. No changes have been made in the management of the Company, except that Captain John Lawson has been made superintendent. The management, since the completion of the power plant at High Falls, is gradually displacing steam by electric power, both in the mines and smelter. In the smelter Mr. P. R. Bradley has resigned, and has been replaced by Mr. D. N. Brown as smelter superintendent.

At the roast yards, the most important innovation has been the use of the steam shovel in loading the roasted ore on the cars prior to its being taken to the smelter. This has proved a great success, and has done away with the old time wheel-barrow brigade in loading the cars. No. 1 roast yard is being abolished. This is east of the town, and on practically the same elevation, thus subjecting the inhabitants to the fumes from the roasting off of the sulphur. Now all the roasting is to be done at No. 3 roast yard, which is north of the town and on much higher ground. The superintendent of the roast yard is Mr. E. W. C. Perry.

Creighton Mine

Captain Thomas Travers was superintendent at this mine with a force of 135 men at the time of inspection on September 1st, 1905. The daily production averaged about 800 tons. The work of mining the ore is still carried on by means of open pit work, the surface of the pit now measuring 500 feet by 300 feet in plan, by a total depth of 140 feet. A new shaft is being sunk in the granite about 500 feet west of the present shaft. By means of extensive diamond drilling the ore body is shown to extend westward from the present pit. The floor of the first level, which was at a depth of 60 feet, has been broken through, giving a stope 140 feet in height from the surface to the second level. An electric search light is used for illuminating the pit at night. It was pointed out to the management that a railing was necessary around that part of the open pit on which work was not being done.

No. 2 Mine

This mine was re-opened about the first of last year, and has since been being worked very steadily, with an average daily production of from 150 to 200 tons. Wm. Hambly is mine foreman, with a force of about 50 men in the mine and 6 men in the rock house. During the last winter the floor between the third and the fourth levels was broken down and the greater part of the ore hoisted. Work on this was necessarily abandoned until more favorable weather, owing to the amount of ice that accumulated on the walls of the open pit. A raise was put through from the fifth to the fourth level and stoping begun. A floor of 25 to 30 feet was left over the fifth level and the walls and roof are very carefully sealed as stoping progresses. An electric pump with a 4-inch discharge is in use on the fourth level. The mine is also equipped at the stations and in the ladder way with electric lights and an electric bell is used for signalling. The system of balanced hoisting is employed

In the rock house the crusher is driven by an electric motor. The crushed ore passes through a grizzly and over a shaking belt which is used as a picking table. Five or six boys are employed in picking out the rock matter from the ore.

Krean Hill

This is another nickel-copper property being opened up by the Canadian Copper Company, on the south half of lot 5 in the fifth concession of the township of Denison, about three miles northeast of Victoria Mine station, and two miles almost due east of Victoria mine. Four diamond drills were put at work here in September 1905, and a great deal of drilling has been done. A force of 40 to 50 men were engaged in stripping and a number more in building camps, etc. Captain Boss who is in charge of the work, expected to begin sinking during the winter. Good results are expected from this property.

Quartz Mine

A new quartz deposit is being opened up by the company on lot 8 in the fourth concession of the township of Waters, about one and a half miles northeast of Naughton. A new rock house 48 feet high has been built and equipped with crusher and screens to separate the fines, which are shipped separately to be used for converter linings. A spur of about one quarter of a mile in length has been built in to the mine from the Sault line, and about 150 tons of quartz a day is shipped to Copper Cliff to be used at the smelter. About 45 men are employed under foreman Walker.

Cobalt Refining Plant

With the discovery of rich cobalt-nickel-silver-arsenic ore in the Temiskaming district in the fall of 1903, came the question of a plant for refining the ore. The Canadian Copper Company took the initiative in this work, and in the spring of 1905 began the construction of a refinery on the site of the old Orford Refining works which

were burned down a few years ago. The method as adopted at present consists chiefly in extracting the arsenic by means of roasting and slagging off the rock material, producing a rich, cobalt-nickel-silver speiss which is shipped to the works of the International Nickel Company in New Jersey for further separation. The plant is very compact; in a receiving room the ore is weighed and fed through a small jaw crusher into a ball mill where it is ground to 20-or 30-mesh. An automatic sampler is attached to the discharge of the ball mill, and takes a sample of one-tenth of the total amount put through. The capacity of the ball mill is about one ton per hour. The ball mill empties into cars which run out on tracks and dump either into cars that lead to the roasting furnace or into storage bins. The sampling floor adjoins the above room, where the sample is further reduced by quartering until a sample sufficiently small for analysis is obtained. The ground ore is loaded into cars leading directly over the roasting furnaces, which are of the Edwards type, and are claimed to have a capacity of 10 tons of mispickel ore every 24 hours. The capacity for the cobalt ore was not determined at the time of my visit. Two of these Edward furnaces are placed along side of each other. They are arranged on a tilting pivot and screw at one end, in order to tilt the furnace, so that the ore will travel along it while being roasted. The ore is mechanically rabbled by revolving arms, every alternate rabble being reversed in motion. The first half of the furnace has water cooled rabbles. From the furnaces, flues lead to the adjacent building into a series of settling and condensing chambers. There are 25 of these chambers, and near the centre of the line is an induced draft, consisting of a fan regulated according to necessity. From the condensing chambers the flue passes to the stack which is 6 feet in diameter and has a total height of about 100 feet. This set of condensing chambers is built in duplicate in order that one side may be cleaned out and fumes turned in the other without stopping the process. This double set of chambers is duplicated to condense the fumes from the hand reverberatory furnace, where the crude arsenious oxide is refined. This furnace is placed at the end of the condensing chambers. The building containing the chambers is 253 feet long. A cupola furnace is being erected adjacent to the furnace building. The roasted ore as it is taken from the roaster is cooled by water being turned on it; this also has the effect of keeping down the dust which would rise from the finely ground roasted ore, and of lessening the quantity blown into the dust chamber after being fed into the furnace. In the cupola furnace the rock matter is slagged off, and part of the silver values settle to the bottom of the matte. These after cooling can be broken away from the cobalt-nickel-silver matte and saved as silver bullion, containing arsenic as an impurity. The rich matte or speiss left will contain cobalt-nickel-silver and some arsenic. This is shipped to New Jersey for further treatment.

The plant is under the management of Mr. S. B. Wright, who employs about 40 men. An office and assay office are adjacent to the other buildings.

VICTORIA MINES

The mine was unwatered during the last months of 1904, and work has been continuous since that time. The owners remain the same, namely, The Mond Nickel Company, Limited, with H. W. Hixon, manager, and C. V. Corliss, mine superintendent. The number of employees at the mine is 65, and the average daily production is 175 to 200 tons.

The two ore bodies are about 160 feet apart and dip uniformly to the east at an angle of about 70 degrees, maintaining about the same distance apart to the eighth level or the depth to which the mine was reached. These ore bodies are described as the east and west ore body. The west ore body cuts across the shaft at the fifth level, thus leaving both ore bodies below that level to the east of the shaft. On the first level the west ore body has been mined out as also the east, except for breaking down

the first level floor. On the second level there are a few months' work on both the east and west ore bodies. On the third level no work has been done since the mine was re-opened. On the fourth level, east ore body, a raise has been put through to the third level, and most of the ore mined out. No work has been done on the west ore body. On the fifth level, the west ore body is right at the shaft and stoping has begun. The east ore body is 160 feet from the shaft and a raise has been put through to the fourth level. On the sixth level, east ore body, a raise has been put through, and on the west ore body a horizontal section begun preparatory to raising to the level above. On the seventh level drifts have been run to the ore bodies and horizontal sections started. On the eighth level, the west ore body is 144 feet from the shaft, and the east ore body is 125 farther on. The west section has been cut full size of the ore body, and a diamond drill station cut out and drifting to the east ore body begun. The shaft was being put down to the next level. About 90 feet had been sunk at the time of my visit. The distance between the eighth and ninth levels is to be 150 feet.

At the roast yards 15 to 20 men are employed in building the roast heaps and loading the roasted ore. The aerial tram buckets dump the green ore at the pile and are loaded from the pocket with roasted ore to be carried on to the smelter. The roasted ore is loaded into cars by hand which are hauled up by hoist and dumped into storage bins from which the bucket is loaded. About 200 men are employed at the mine, roast yard and smelter. The smelter is being operated continuously, being under the direct charge of the manager. Only one furnace is used at a time. The matte is run direct from the settler of the furnace to the converters.

The Mond Nickel Company are prospecting several other properties. Lot 5 in the third concession of the township of Garson is being tested with a diamond drill.

SHAKESPEARE GOLD MINE

Since last inspection it is understood that this property has changed hands, and that the majority of the stock has been bought up by other interests. The company operating the mine is known by the name of the Shakespeare Gold Mining Company, Limited, and at the time of my last visit the superintendent was Thomas Trotter, with Edward Doherty, mine captain, employing in all 29 men.

Since the last Report the shaft has been sunk to the 150-foot level and sinking below this level had begun. The ore body consists of two parallel veins, or rather enriched portions, as the vein material has a width of at least 40 feet. The enriched zones occur on the north and south sides of this vein known as No. 1 and No. 2 veins. These zones are in the vein material, which is chiefly quartz and chlorite schist, the latter being highly altered and not in contact with the country rock. The quartz carries a small quantity of concentrates which are chiefly pyrites. The ore shoots dip nearly vertical and have been quite uniform in occurrence to the depth to which development has progressed.

On the first level number 1 vein has been driven east 10 feet and west 35 feet. The shaft touches No. 1 vein on the 100-foot level. The ore has been stoped out for 35 to 40 feet along the vein up to the 50-foot level. On No. 2 vein the east drift has been driven 130 feet, and the west drift 50 feet. Stoping has begun on the east drift. On the 150-foot level, No. 1 vein has been driven east 30 feet and west 35 feet. The ore has been stoped out for about 22 feet above the timbers on this vein. On No. 2 vein the east drift has been driven 75 feet and west 15 feet. A raise has been put through from the east drift on this level to the surface for the purpose of ventilation. The stamp mill has run continuously all year. The first battery of five stamps began dropping on the 3rd of February 1905, and the second battery of five stamps in April of the same year With the taking over of the work by the new management it is stated that the

mill has been closed down and all work directed to the development of the ore body. In one month's run of the 10 stamps over $7,000 was taken off the plates. The tailings carry about $1.60 and the concentrates $40.00 per ton.

In the Michipicoten district no work was done on the gold properties during the last year. The Manxman, Mariposa and Grace mines are apparently waiting until they can obtain cheap power.

The Algoma Power Company are developing a water power on the Michipicoten river, about 7 miles from the Mission and 10 miles from the Helen mine. The company is composed of men chiefly from Berlin, Ontario. If cheap power can be furnished, a nnmber of the small gold mines in the section, which cannot be operated successfully owing to the difficulty of obtaining fuel, will probably be worked at a profit.

COPPER MINES

Massey Station Mine

This mine was inspected twice during 1905, once in March and once in November. At the last inspection the staff had been changed, Mr. A. H. Sancton having been appointed superintendent in place of Mr. H. W. Hardinge, resigned. The mine was in operation all year, but the mill had closed temporarily owing to lack of water, and some ore was being shipped to the Victoria mine to be used there as converter lining. No work has been done during the last year below the fifth level, which remains unwatered. Second level: a little ore has been hoisted from the east stope. Third level: east drift continued 10 feet and west drift 25 feet. A raise has been put through from the fourth to the third level in the west drift and ore was being stoped out. Fourth level: unchanged except for raise in west drift to the level above. Fifth level: in the east drift the raise is within 20 feet of the fourth level, while in the west drift, a raise has been carried up about 30 feet and some stoping done. The hoisting shaft has been partitioned off from the ladder way, to the fifth level, below which no work is being done.

About 13 men are employed above ground and 12 below ground under mine captain J. O Summers.

A new showing of chalcocite, bornite, and chalcopyrite was opened up three-eighths of a mile west of the present mine on the same ridge and strike as that of the vein at present being worked. A 22-inch vein of chalcocite was struck on the top of the ridge, replaced by bornite in a few feet, and then by chalcopyrite. There were two showings of the bornite about 40 or 50 feet apart. Nine tons of high grade ore carrying over 50 per cent. copper was shipped to New York, and 30 to 40 tons of lower grade to the Victoria Mines smelter The ore occurs in a fractured zone in the quartzite and takes on a rather schistose character in places. One wall is very clearly defined, but the other wall occurs quite frequently impregnated with the ore. In one place the bornite occurs impregnated in the rock material to a width of 4 feet, averaging 4 to 5 per cent. of copper. The chalcocite and bornite appear to be the lower part of a zone of secondary enrichment, the upper part having been eroded and carried away.

The Elmore oil concentrating plant at the Massey mine was installed in the summer of 1904, and has been quite thoroughly tested since that time. The ore is trammed from the shaft house to the mill, where it is put through a 9 by 15-inch crusher. A conveying belt carries the crushed ore to the ball mill, where it is crushed to 8-mesh then to a tube mill with a proved capacity of 75 tons crushing to 80- or 90-mesh. The pulverized ore is then conveyed to the mixers, where a given quantity of oil is fed in and the ore and oil thoroughly mixed. From the initial mixer the ore and oil passes through a separator, then to a second mixer and a second separator before passing to the centrifugal machine. The plant has concentrated 35 to 42 tons of ore per day during a run of 113 days and produced 507.62 tons of concentrates, which returned

74.95 tons of copper. Of oil 15,504 gallons were used at 16 cents a gallon, or 4.3 gallons per ton of ore concentrated. The average assay value of the ore was 2.7 per cent. copper, and the returns on the concentrates showed a recovery of 2.1 per cent. The capacity of the centrifugal machines was found to be too low to permit of the plant being run at the rated capacity of 50 tons per day, and an extra set of centrifugals is now being installed. The plant was run intermittently owing to inadequate water supply. A dam has been built to overcome this cause of frequent stoppages, and the plant is expected to be able to handle at least 60 tons of ore per day when it is put in operation again, with but slight increase in the cost of operation. The greater part of the ore concentrated was from old dumps, and consequently was partially oxidized. It was found that when milling freshly mined ore the tailings did not assay over .25 to .35 per cent. of copper.

Hermina Mine

Mining work was carried on on this property until the thirtieth of September, 1905, on No. 1 shaft, which is on the southeast end of the property. The shaft was sunk to a depth of 300 feet and a cross-cut run N. 30° E. for a distance of 50 feet to the vein. A station 14 feet by 14 feet was cut on the third level. The shaft was not timbered between the second and third levels. When operations ceased at the shaft, work was begun on No. 3 shaft, which is about a mile northwest of No. 1 shaft. Here a three-compartment shaft is being sunk 15 feet by 7 feet, inside measurement, with two hoisting shafts 5 feet 2 inches by 7 feet, and ladder way 3 feet by 7 feet. At the time of inspection the shaft had been sunk 65 feet. The shaft is being sunk on the vein, which is quartz carrying chalcopyrite.

New machinery has been installed, consisting of a straight line 8-drill Rand air-compressor, one 60-h.p. boiler, locomotive firing, and a 75-h.p. Allis-Chalmers Lidgerwood hoist. A new blacksmith shop, boiler and compressor house, boarding and sleeping camps have been built, and a new hoist house was to be erected at once. The superintendent is Edward L. Herman, and mine captain Wm. Daniells, employing a force of 38 men.

Prospect in May Township

On the south half of the north half of lot 1 in the sixth concession of the township of May considerable prospecting was done in 1905 by the Tarsus Sulphur and Copper Company of Glasgow, Scotland, under option from Thomas Trotter. A shaft was sunk 41 feet on the south side of the vein, and a cross-cut run north 14 feet. On the north side of the vein a shaft was sunk 15 feet. On the surface a trench was cut two feet deep across the entire width of the vein, which is 60 feet, and consists of quartz quite highly mineralized with copper pyrites.

Bruce Mines

These mines which are the oldest in Ontario, having been first opened in 1843, have recently been acquired by the Copper Mining and Smelting Company of Ontario, Limited, and the water is being pumped out of No. 4 shaft. This mine was closed about the middle of the summer of 1901, owing to the destruction of the head-work by fire, and although the shaft building was rebuilt, mining has not since that time been resumed. The work is in charge of H. J. Carnegie Williams. Some very prominent English mining men are directors of the company, and it is hoped that the property, which has had such a varied career and has produced such a large amount of copper, will be put on a paying basis.

Superior Mine

At the time of the inspection of this mine in November 1905, the mill was ready for work and development work was proceeding in No. 6 shaft. In this shaft, which

has reached a depth of 264 feet, no work was being done below the 100-foot level. On this level drifts had been run 75 feet northwest and southeast on the vein. No stoping had been done. The property is owned and operated by the Superior Copper Company, with William A. Madison as manager, employing a force of 25 men. The plant used for mining purposes consists of two 60-h.p. locomotive firing boilers and half of a 12-drill Ingersoll-Sergeant air compressor.

The new concentrating mill at this mine was completed in November 1905. The motive part of the plant consists of one 10-h.p. tubular boiler, a 100-h.p. heater and a 75-h.p. heater, mill and feed pumps and mill engine, 14 inches by 36 inches, giving 80 revolutions per minute. The mill is built adjacent to the shaft house, to which the ore is trammed by car from the hoisting cage and dumped over a grizzly. The over size is then put through a 16 by 10-inch style "B" Farrell crusher, crushing to 1½ inches, with a capacity of 100 tons in 10 hours, the undersize and crushed product passing to a storage bin. The ore is fed from a storage bin by a Challenge feeder into an elevator which hoists it to a set of 30 by 15-inch style "C" rolls crushing to five-eighths of an inch. This passes direct to a 3 by 6-foot shaking screen. The undersize from this passes direct to the classifier, and the oversize to a set of high speed 40 by 14-inch rolls crushing to about 10-mesh, and again to shaking screen 3 by 6 feet, which return the oversize to be reground. The crushed product that passes through screens passes direct to a three-compartment hydraulic classifier, passing from this to 4 No. 4 Wilfley tables. The product from each compartment of the classifier is led to a separate Wilfley table, as also the slime.

The dimensions of the mill building are 52 feet 6 inches long by 25 feet wide, of the Wilfley table room 42 feet 6 inches by 31 feet 4 inches, of compressor and engine room 32 feet by 17 feet 6 inches, and of boiler house 32 feet by 31 feet.

Northern Ontario Copper Company

This company commenced operations last winter on a copper prospect on the north half of section 13, in the township of Thompson near Dean lake. Owing to the late season at which work was begun, it was impossible to visit the property, but from Mr. J. A. Montague, who has charge of the work for the company, it was learned that a shaft had been sunk on the vein to a depth of 30 feet. The strata occurring on the property consist of slate and quartzite, the latter overlying the former. The dip of the strata is approximately 75 degrees from the horizontal. An eruptive dike consisting largely of pyroxene with slate and quartzite inclusions follows the bedding planes of the strata in the slate, and some times at its contact with the quartzite on a course of 87 degrees east. In this dike immediately adjoining its contact with the slate, chalcopyrite and micaceous hematite is found, and this mineralization extends into the slate for a width which is at present undetermined. Calcite in appreciable quantities accompanies the ore in both the dike and the slate.

At a point situate about 1,500 feet north 87 degrees east from the above mentioned shaft, fairly good ore has been exposed for a width of 3 to 4 feet.

Two boilers having a combined capacity of 65-h.p., a hoist and two drills, have been placed upon the property, and half of a four-drill air compressor is being installed, and camps are being built for the accommodation of the men.

Whiskey Lake Copper Properties

From Mr. J. A. Montague I learned that considerable prospecting was done in this area in 1905. A shaft was sunk 30 feet on a vein of chalcopyrite and a drift 24 feet in length was driven under Whiskey lake. A porphyritic dike occurs about 14 feet from the copper vein and parallel with it. Smaltite occurs near the dyke and parallel with it near the southwest corner of township 138, and about two miles west of the northerly portion of Whiskey lake, large boulders of chalcopyrite have been

found. In this copper float a reddish brown mineral weighing from 5 to 6 pounds occurred, which re-acted for cobalt and sulphur and gave .6 per cent. of arsenic on analysis. On this location copper ore is found in place, but very low grade.

On White Fish lake one mile west of Whiskey lake claim, on W R 352, a mineralized zone occurs about 20 feet in width carrying chalcopyrite. This zone lies in a diabase dike about 100 feet south of the contact with the quartzite. Masses of pure chalcopyrite were found in this weighing as much as 300 pounds.

On the north reaches of Caribou lake argentiferous galena occurs in a massive condition.

Northeast of Bear lake is a very wide quartz vein containing bunches of calcite, also small bunches of argentiferous galena, the pure galena running from 100 to 160 ounces per ton in silver, and from a trace to an ounce per ton in gold. The vein is about 20 feet wide and occurs in a diabase dike near the quartzite contact. The dikes dip at high angles from the vertical, and in them the galena is always associated with chlorite schist.

The Long property on McCool lake has a quartz vein from one to six feet in width and traceable for at least four miles. It follows an eruptive dike which forms the southerly wall. This vein lies south one-quarter of a mile and over a hill from the boulder vein. The gangue of the boulder vein is quartzite impregnated with calcite, while the other is typical white quartz.

IRON MINES

Helen Mine

This property, the largest producer of iron ore in Ontario, is owned and operated by the Lake Superior Power Company, with Mr. R. W. Seelye, superintendent, employing about 170 men. The mine produces on an average 800 tons of ore per day. During the summer this ore is shipped direct by Algoma Central railway to the ore dock at Michipicoten, where it is loaded on boats to be shipped to Midland, Hamilton, Pitsburgh, or wherever the ore is marketed. During the winter the ore is stock-piled some four miles from the dock, from which it is loaded by steam shovel in the summer time on to the cars for shipment to the ore dock. One engine and train crew is kept at work continually handling supplies and ore cars. The ore cars have a capacity of about 50 tons per 24 hours.

No. 1 shaft has been sunk to a depth of 286 feet. This is a vertical two-compartment shaft, one compartment being used for a cage and the other for a ladder way. The cage is not used for hoisting men. The shaft is only used for development work, not for hoisting ore. From No. 1 shaft on the third level a drift has been run to connect with No. 2 shaft. This shaft, which has a double skip road, has been extended to this level. The timber work and skip track are being put in between the second and third levels. A drift some 13 feet wide (for double track) is being driven from this No. 2 shaft to tap the ore body. This drift is solidly timbered from the contact of the country rock (greenstone schist) through the decomposed clayey material to the ore body. The clayey material has a width of about 30 feet, lying between the greenstone and the ore body. A new Cameron pump, with 8-inch discharge has been installed on this level, but is not used all the time, as a No. 9 Cameron keeps the mine fairly free of water. All the ore shipped was being hoisted from the second level at the time of my inspection.

The system of mining used in getting out the ore is similar to the "room and pillar" method in coal mining. The main drift is driven down the whole length of the ore body which is about 500 feet and drifts are run from this main drift at right angles to it. Raises are made from these cross drifts for man holes, and the ore is stoped from the chambers by overhand stoping. The method is analogous to the methods

of mining used in the iron mines of Minnesota. The stopes are not more than 60 feet high, and are all worked out on the south side of the main drift on the second level. There are two kinds of ore in the mine, namely red hematite and brown hematite, the former being higher in iron and the latter in moisture; in fact, the latter approaches very closely to a limonite. The brown ore comes mostly from the east end of the pit, and the red from the west end. A body of pyrite running 50 per cent. sulphur occurs on the northeast side of the deposit. This pyrite is in a fine granular condition, but is not being taken out at present. The ore does not increase appreciably in sulphur until within a few feet of the deposit of pyrites. The ore is dumped direct from the skip into an Austin crusher of 2,500 tons capacity crushing to 6 inches. All work in the mine is done by contract. The machine men get so much per ton of ore broken, and the laborers and trammers so much per car. There are 12 machine drills running on each shift.

At the Josephine mine during the summer of 1905 some diamond drilling was done, but there has been no mining since the close down in 1903.

Breitung Iron Mine

This mine, formerly called the Loon Lake iron mine, is situated on Loon lake about one and a half miles from Wilde station on the Algoma Central railway. The property is owned and is now operated by the Breitung Iron Company, Limited, of Marquette, Michigan. The president of the company is George Wagner, the general manager Edward Breitung, and the superintendent J. W. Bodilly. Work was commenced by the present company in July 1905, after the Loon Lake Iron Company, who were operating it at the time of the last inspection, allowed their lease to expire.

The main shaft remains the same in depth, but has been timbered to the bottom, and a ladder way has been put in. A drift has been run south 20 feet. No work was being done in this shaft at the time of inspection. The tunnel, which is 180 feet southeast of the shaft, has been driven in about 300 feet. At 210 feet cross-cuts have been run 37 feet southerly and 65 feet north to northeast. The winze in the south cross-cut has been enlarged to a shaft 10 by 12 feet and has a depth of 63 feet. Drifts are being run north into the foot wall and in a southeasterly direction. The ore has been stoped out directly over the winze and east of it, 40 by 37 feet and 25 feet high. A new tunnel has been started on the level of the railway track 95 feet above the lake and 74 feet below No. 1 tunnel, and driven in a distance of 132 feet.

A new powder magazine has been built about 800 feet north of the engine house, as well as two new thawing houses. About 150 tons of ore per week is being shipped to the smelter at Sault Ste. Marie.

The ore occurs as a hematite formation in banded slate. A dike of greenstone forms the foot wall of the winze being sunk. This has a strike north 60 degrees east. Other greenstone dikes cut the formation between the winze and the shaft at an angle of south 60 degrees east. The strike of the slate formation is north 15 degrees west.

Williams Iron Mine

This property which gave so much promise of becoming a good shipper during the fall of 1904 for some unexplained reason ceased operations in March 1905, after some ore of very good quality has been shipped to the furnace at the Sault. It is owned by the Williams Iron Mine Company, Limited, with John E. Burchard president, and C. C. Williams, manager.

On the 200-foot level a drift has been run north from the shaft 20 feet and south 16 feet. A cross drift over 100 feet in length has been run from the end of the 16-foot south drift. This cross drift extends 25 feet east of the shaft and at 25 feet west a

drift has been run north 30 feet, and at 50 feet west another drift has been run south 75 feet, cutting some good ore from which about 200 tons have been shipped. A good deal of diamond drill work has been done. The plant is in good shape to begin operations.

PETROLEUM AND NATURAL GAS

During the summer of 1905 the Northern Oil and Gas Company, whose head office is in Chicago, drilled several holes on the eastern end of Manitoulin island, about two miles southeast of Wekwemikong. Of six wells drilled during the summer three were producers and three dry holes. Oil has been known to exist on the eastern part of the island for a long time. The Utica shales which outcrop at Cape Smyth are very bituminous, so much so that a spring of petroleum rises from them at Maple point, and flows intermittently throughout the year. Some wells were drilled in search of oil in 1866, and the log of the well as then recorded shows about 500 feet of strata encountered consisting of Hudson River, Utica, and Trenton. Dr. Robert Bell of the Geological Survey surveyed the island geologically, and his report is found in the Report of the Geological Survey for the years 1863-66. He pointed out that fifteen anticlinals exist on the island, traversing it a little west of south. Two wells were drilled on the anticlinal cutting across the island from Wekwemikong to the north. No oil, however, was found in either of these wells. During the last few years some four or five holes were drilled by Senator Poirier near Sheguiandah giving a little showing of oil.

From the wells drilled and from outcroppings it has been found that the Trenton rests on the Huronian and has a dip to the south of 35 to 40 feet per mile. The upper series of the Trenton consist of bluish and brownish magnesian limestones, and the whole series has a thickness of about 320 feet. An analysis by Mr. A. G. Burrows of drillings from the Trenton gives the following:

	Per cent.
Lime	32.17
Magnesia	12.02
Alumina	2.52
Ferric oxide	4.61
Loss on ignition	42.12
Insoluble	7.0[illegible]

There is an exposure of the Utica shale on the eastern end of Manitoulin island. Here it outcrops as Cape Smyth east of Wekwemikong, and has a thickness of 50 to 60 feet of very bituminous material, consisting of bluish and greenish argillaceous shales inter-stratified with gray drab-weathering calcareous limestone, having a thickness of probably 300 feet.

The wells drilled by The Northern Oil and Gas Company in 1905 were drilled at an elevation of 155 feet above the lake, and produced in all about 500 barrels of oil, one well producing about 50 barrels in the first 12 hours after shooting. The logs of some of the wells drilled by this company are as follows:

No. 1 Well.

Limestone	50 feet	Niagara.
Light shale	250 feet	
Gray shale	62 feet	Utica and Hudson River.
Black shale	21 feet	
Limestone	137 feet	Trenton.
Total depth	520 feet	

The Trenton limestone was struck at a depth of 383 feet and gas at 398 feet. This well shows 50 feet of Niagara limestone to have been passed through before encountering the shales.

No. 2 Well.

Surface	34 feet	
Limestone and shales	90 feet	Niagara and Hudson River.
Light shale	161 feet	Hudson River and Utica shales.
Gray shale	65 feet	
Black shale	9 feet	
Limestone	50 feet	Trenton.

The Trenton limestone was first struck at a depth of 359 feet, and gas and oil at 380 feet or at a depth of 21 feet in the Trenton.

No. 4. Well.

Sand	15 feet	
Limestone	50 feet	Niagara.
Light shale	250 feet	Hudson River.
Dark shale	70 feet	
Black shale	22 feet	Utica.
Limestone		Trenton.

The Trenton limestone was struck at 407 feet, and salt water at 438 feet.

No. 5 Well.

Sand	14 feet	
Limestone	50 feet	Niagara.
Light shale	250 feet	
Dark shale	94 feet	Utica and Hudson River.
Black shale	12 feet	

The limestone was struck at a depth of 420 feet, and oil at 437 feet, or a depth of 17 feet in the Trenton. About 5 feet of soft porous oil rock was passed through at a depth of 437 feet.

No. 4 well is 640 feet northwest of No. 5. No. 1 is about the same distance northwest of No. 4, and No. 2 is about 500 feet northeast. Another well has been drilled northeast of No. 2 at an elevation of 55 feet, and the Huronian was struck at a depth of 625 feet. The oil is a very good quality, registering 36 Baumé at 60 degrees.

A well was also drilled near Manitowaning by Mr. Tucker, but no oil was struck.

III.—Temiskaming District

SILVER-COBALT MINES

Following is a summarized description of the principal deposits of cobalt-nickel-arsenic and silver ores which have been, or are being worked.

La Rose Mine

This mine is situated on mining location J S 11 at the north end of Cobalt lake. It comprises 40 acres, and is owned by the La Rose Mining Company, president J McMartin, and manager Noah Timmins.

The property was first taken up in the fall of 1903, and has since the summer of 1904 been worked steadily. The main vein, on which the greater part of the work has been done, has been very systematically developed. The shaft is vertical, and has now reached a depth of 280 feet, and sinking is being continued. The first level at a depth of 90 feet has a drift running north 179 feet and south to connect with the air shaft to the surface 100 feet. South of the air shaft the main vein has been followed 178 feet. From this main vein two veins have been followed southeast for 50 feet each. A winze has been sunk 100 feet north of the main shaft to conect with the second level a distance of 100 feet. In the south drift a winze has been sunk 12 feet at a point about 100 feet south of the air shaft. The second level at a depth of 190 feet has a drift running north on the main vein 110 feet connecting with the winze from the first level. The south drift on this level has been run about 100 feet. About 59 feet from the shaft on this drift a cross-cut is being put in and has now been driven 35 feet. Also on this level a cross-cut has been driven in the hanging wall west from the shaft 80 feet, and in the foot wall 35 feet for pump and also for hoist for sinking.

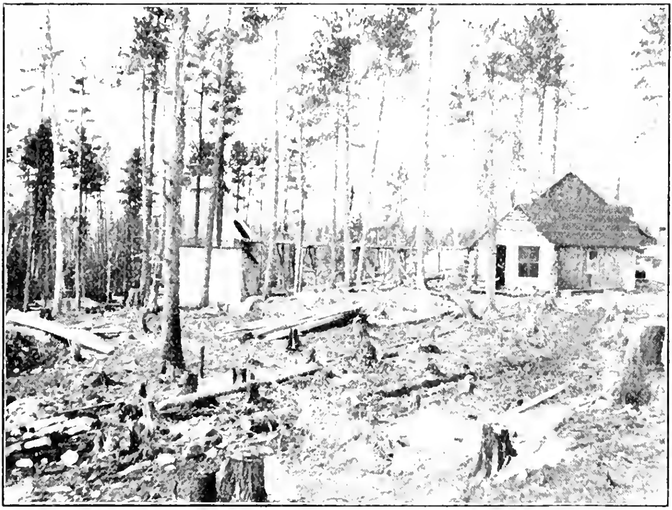
Three other veins of the property are being developed. About 100 feet south of the air shaft a vein cuts the old vein at nearly right angles and has been traced in a direction a little south of east for about 800 feet, cutting across the ridge at right angles. A few carloads of very rich ore has been taken out of this vein, which runs high in native silver. The ore has been mined from this vein by open cut work to a depth of 12 or 15 feet, where stulls are put in at a depth of 6 feet covered with lagging and then loaded with waste material. About 400 feet north of this vein on the same ridge, another vein has been worked, a drift run into the hill for 25 feet, and an open cut carried out from the hill to a depth of 8 feet. The vein has a strike of east and west. About 100 feet farther north a parallel vein is being worked. This vein carries high values in native silver, argentite and niccolite. The vein does not outcrop on the top of the hill, and is therefore being worked by a drift in the hillside. A number of smaller veins have been found, but are not being worked at present.

The surface plant consists of a 40-h.p. locomotive firing boiler, a small upright boiler, a 4-drill straight-line air compressor, and hoist. In the shaft house are picking tables for sorting out the ores, gyratory crusher for crushing the ore to a standard size, engine and ore bins. Camp buildings, consisting of bunk house, dining hall and office have been built. A force of 45 men is employed under superintendent John Harris.

New Ontario Mine or J B 7

The original owner of this property was Mr. W. G. Trethewey, but it has recently been taken over by the Trethewey Silver-Cobalt Mining Company, of which Mr. Trethewey is president. The property is known as mining location J B 7, and is situated in the southeast quarter of the north half of lot 6 in the sixth concession of the township of Coleman, about one quarter of a mile northwest of Cobalt. It was located by Mr. Trethewey in the spring of 1904 and has been worked continuously since that date, producing about $250,000 worth of ore.

Very little prospecting has been done on this lot as yet. The main vein, which is on the south side of the lot, has a strike of about east and west, and cuts across the ridge at right angles. The shaft, 5 by 8 feet in plan inside of timbers, has been sunk a depth of 70 feet and sinking is now being carried on. At the 50-foot level, a drift has been run east a distance of 195 feet following the vein. At about 60 feet east of the shaft a drift has been run southeast for about 65 feet on an offshoot from the main vein. West from the shaft a drift has been run 35 feet on the vein. On the east side of the shaft the ore has all been stoped out for a distance of 40 feet along the vein to the first level. On the surface the vein has been traced west from the shaft a distance of 125 feet, and 10 to 15 feet of a stope taken out by



Trethewey silver-cobalt mine (J.B. 7).

Trethewey silver-cobalt mine : shaft house and compressor house.

open cutting. The ore in this working was mainly smaltite for about 100 feet, when it changed to pyrrhotite, chalcopyrite and galena. A narrow vein parallel to the main vein has been uncovered 100 feet north of it

The surface plant consists of shaft house 35 feet high, boarding house and compressor and boiler house. The latter is situated 100 feet east of the shaft house, and in it two boilers, one a 60-h.p. locomotive firing and one 80-h.p. return tubular, a 12-drill duplex Rand air compressor and a small hoist have been installed.

A force of 20 men is employed under superintendent J. Reddington.

Coniagas Mine or J B 6

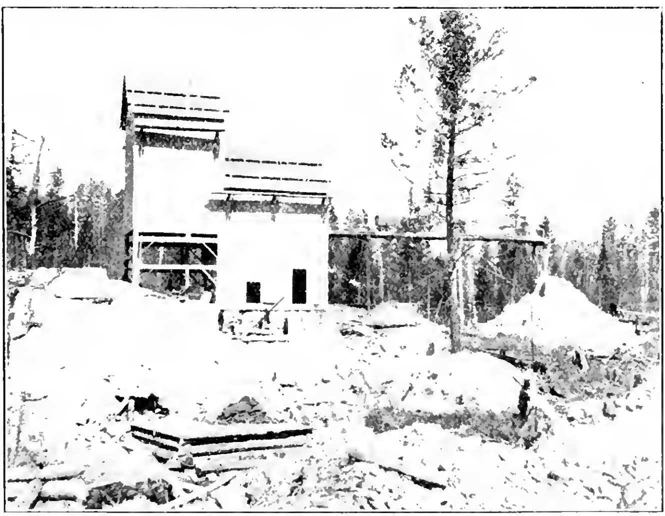
This property, consisting of 40 acres, lies directly south of J B 7 on the town site of Cobalt, Messrs. W. G. Trethewey of Toronto and R. W. Leonard of St. Catharines being the chief owners. It was located in the spring of 1904, but owing to a dispute as to ownership it was not worked until the first part of 1905. Several veins have been uncovered all lying parallel and cutting the ridge at right angles Only two of the veins are at present being worked. These lie just south of the boundary between J B 6 and J B 7, and are parallel to the main vein on the latter. No. 1 vein has been open cut to the level of the valley lying west of it for about 75 feet on the vein. Drifts were run on the 75-foot level east 90 feet and west 60 feet. Six feet in from the shaft on the west drift, a cross-cut was run south 30 feet to cut No. 2 vein. At the junction with the vein a raise was put through to the surface. This has been timbered and is used as the permanent working shaft, being 5 by 8 feet inside of timbers, with hoistway 5 by 4 feet and ladder way 5 by 3½ feet in plan. Drifts are being run east and west on No. 2 vein, and a cross-cut from the east drift on No. 1 vein north to cut a vein that has been discovered near the north boundary line. An ore house and shaft house have been constructed, and hoisting is done by means of a duplex cylinder 5 by 5-inch Jenckes hoist. The power for the operation of the mine is obtained from a central power plant, situated on J B 7 and was described under that head.

Twenty-five men are employed under superintendent J. Reddington.

Buffalo Mine

This property is situated southwest of J B 6 on the town site of Cobalt, and is the southwest quarter of the south half of lot 6 in the sixth concession of the township of Coleman. The former owner and operator of the property was C. L. Denison of Buffalo, but it has been transferred to the Buffalo Mines, Ltd, C. L. Denison being president of the company. Mining work was begun in the spring of 1905 and has been carried on since that time. A number of veins have been found, but work is at present being concentrated on a vein on the east side of the property. A shaft 5 by 8 feet inside of timbers has been sunk on this to a depth of 70 feet, and drifts have been run west 105 feet and east 70 feet. On the west drift a stope 18 feet high and 28 feet long has been made and stoping has commenced in the east drift. East of the shaft on the same vein at 200 feet distant, a tunnel has been driven into the hill, and the ore has been taken out by open cut work for a depth of 30 feet On the west end of the vein a shaft (No. 5) has been sunk to a depth of 50 feet and 25 feet of drifting done east and west from the shaft; the main shaft is partitioned from the ladder way and timbered the entire depth with square sets, and a cage is being put in. The power plant consists of an 80-h.p. boiler, one half of a 10-drill Rand air compressor and an 8 by 10-inch double cylinder Jenckes hoist. The head frame for the shaft is 36 feet high, 16 feet square, and has rock house attached 16 feet by 20 feet by 24 feet high. A system of bins has been put in for storage and sorting the ore.

Buffalo silver-cobalt mine : compressor house.



Buffalo silver-cobalt ; mine shaft house.

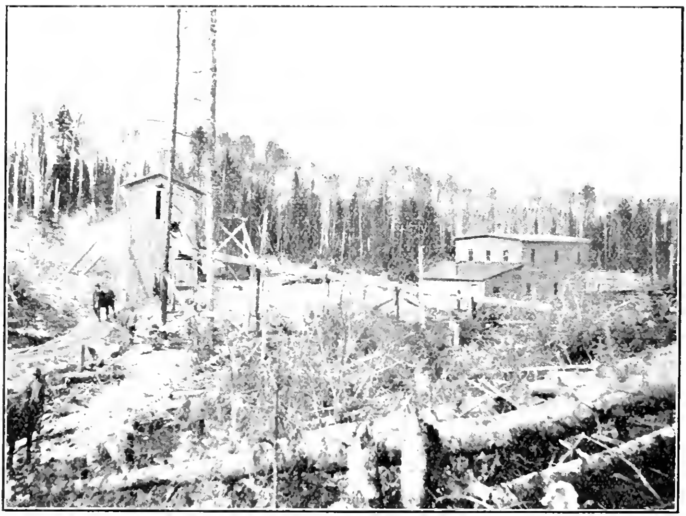
No. 4 vein has been leased from the company by Messrs. Doyle and Company and a shaft 50 feet deep sunk and drifts east and west begun.

No. 3 shaft 500 feet west of No. 4 is 50 feet deep with no drifting done. No. 2 shaft formerly leased to Messrs. McRae and McDonald is 30 feet deep.

Superintendent T. R. Jones has a force of 30 men employed.

Cobalt Silver Queen

This property owned by this company consists of the southeast part of the north half of lot 7, in the fifth concession of Coleman, on which the mine is situated, and the southwest part of the north half of the same lot. It was formerly owned by the Temiskaming and Hudson Bay Mining Company, but has recently been transferred to the above mentioned company, of which Lt.-Col. John I. Davidson of Toronto is president. The vein is located on the northeast corner of the lot, and two shafts have been sunk on it only a short distance apart. The vein strikes west of north; the westerly shaft has been sunk 65 feet, and the easterly, which is an enclosed shaft following the dip of the vein, 90 feet. The first level at a depth of 65 feet has drifts running east on the



Cobalt Silver Queen mine, Cobalt.

vein 90 feet and west 70 feet. A cross-cut has been driven south from the 65-foot level from the west shaft a distance of 30 feet. The vein on this property dips to the south at an angle of 30 degrees from the vertical. This is an exception to the rule in the Cobalt camp, where the veins for the most part are nearly vertical. The ore is smaltite carrying high silver values, and the vein is found cutting the conglomerate.

A new 5-drill compressor has recently been installed along with a double cylinder hoist with a 30-inch drum and a 60-h.p. return tubular boiler. A new boarding house has also been erected. Captain W. Vincent was in charge at the time of my inspection, employing a force of 20 men.

Temiskaming and Hudson Bay Company

Since the transfer to the Cobalt Queen Silver Mining Company of their working mine, this company have confined their attention to prospecting their other locations to the west and north of the Cobalt Silver Queen mine, comprising in all nine 40-acre locations. On the northeast quarter of the north half of lot 7 concession 5, Coleman, a shaft has been sunk 60 feet, but no ore has as yet been shipped.

McKinley and Darragh Mine

The property known as mining location J B 1 at the south end of Cobalt lake has recently been transferred by the former owners to the McKinley-Darragh-Savage Mines, Ltd., and is now being operated by them. The shaft which was originally sunk to a depth of 60 feet, and drifts run north from it towards the lake encountered some very loose ground, which made it impossible to work it further. The present company have filled the lower part of the shaft with rock, overlaying it with concrete and cement, and hope to be able to get out the ore. Another shaft has been sunk further south on the vein, and all work is being done through it. A second vein was discovered about 300 feet west and parallel to the old one. Some open cut work was done, and a shaft is now being sunk on it. A great deal of free silver has been found in the gravel on the shore of the lake, which has been bagged and shipped.

New machinery has been installed consisting of two boilers of a capacity of 52-b.p. each, air compressor and hoist. New camp buildings have also been put up. Mr. McDonald is in charge with a force of 25 men.

Nipissing Mines

The Nipissing Mining Company own a block of land in the centre of the Cobalt camp comprising 846 acres. Only a small fraction of this area has been thoroughly prospected. The mines on this property have had the largest total production of any in the camp. From 25 to 30 veins have already been found, and of this number 11 of the veins were being worked at the time of inspection. The most extensively developed vein is the Little Silver vein, which was the first silver vein on the property to be found and developed. A large tonnage of very high grade ore has been taken from this vein, the workings in which have reached a depth of 106 feet. The ore has been mined chiefly by open cut work. A small upright boiler furnishes power for a steam drill and hoist.

Veins number 6 and 25 are situated about the centre of R L 404, a little south of what was known as Cobalt farm. These are about 300 feet apart and have been opened by open cut to a depth of 50 feet, producing rich silver ore. Both of these veins have small upright boiler, hoist and drills. Hoisting is done by means of a swinging arm derrick.

Vein number 26 in the northeast part of R L 404 has been open cut to a depth of 30 feet. This vein in some places carries native silver in a very coarsely crystallized calcite. Hoisting from this vein is done by means of derrick and gasoline hoist.

Veins numbers 21, 13, 15, 12, 2 and 9 are being worked by open cutting to depths of from 15 to 30 feet. All of these veins carry silver values in the smaltite. New veins have been discovered on various parts of the property during 1906.

A large hydraulic plant has been installed on the shore of Peterson lake for the purpose of washing the soil off the surface, thus exposing the rock and any veins that may outcrop. The plant consists of two 125-h.p. boilers, a 150-h.p. engine and an 8-inch two-stage turbine pump with a capacity of 1,800 gallons of water per minute. This method of prospecting is new in Ontario and will be watched with much interest.

On the shore of Cobalt lake a small crushing plant has been put up for the purpose of crushing the ore to a uniform size before shipment. A large quantity of the ore is shipped to the cobalt plant at Copper Cliff for treatment.

Mr. H. Linney is superintendent, employing a force of 90 men, which is to be increased as soon as accommodation can be provided.

O'Brien Mine

This property is mining location R L 403, and the mine is just east of the La Rose mine. The property is owned by Mr. M. J. O'Brien and his associates, and is operated by them. A shaft has been sunk to a depth of 200 feet on the vein and levels have been opened at 50 and 100 feet respectively. Drifts have been run east on the vein on the 50-foot level a distance of 125 feet and west about the same distance. At the end of the east drift a raise has been put through to the surface on an incline of 45 degrees. On the second level drifts have also been run east and west on the vein. The shaft is timbered and hoistway partitioned from the ladderway. The ore house is connected with the shaft house. A few feet from the shaft house the boiler and compressor house have been built enclosing two boilers, a 4-drill compressor and hoist. A large dining room and bunk house have been built adjacent to the mine buildings. Very little prospecting has been done outside of this on the location owing to suit with the Crown regarding the title.

Mr. M. T. Culbert is superintendent, employing a force of 25 men.

Violet Mine

This property comprises the northwest quarter of the south half of lot 3 in the sixth concession of Coleman township, and was located in the spring of 1905. It has been worked quite steadily since that time, and some rich ore has been taken out. The shaft has now reached a depth of 100 feet, and at the bottom a drift has been run west 30 feet. The ore was at first taken out by means of open cut work, a cut 60 feet long and 25 feet deep being made. From this depth the shaft was sunk and the open cut timbered by stulls being put in and these overlaid with lagging. Some little prospecting was done on other parts of the lot, but no mining work.

No machinery has as yet been put in, but camp buildings have been erected. Mr O. W. Albee is superintendent, employing a force of 10 men.

Hanson Cross Lake Mine

This property, comprising the southwest quarter of the south half of lot 3 in the sixth concession of Coleman township, has been transferred from the original owners, Messrs. McLeod and Glendinning, to a private enterprise in which the owners of the La Rose mine are chiefly interested. Work was carried on during the winter on the property just south of the Violet, by means of an open cut 20 feet in depth. A large number of narrow veins have been located on the property, but very little mining work has been done. A new plant consisting of boiler, compressor and hoist is to be installed in a short time.

Mr. R. H. M. Anson-Cartwright is superintendent, employing a force of 20 men.

Watts and Allen Mine

This property consists of the northeast quarter of the north half of lot 3 in the fifth concession of Coleman township, and is owned by the New Ontario Cobalt and Silver Mining Company, Mr. W. G. White being president, and Mr. Edwards Watts. manager. The vein on which the shaft has been sunk is on the edge of a high bluff on the west side of Cross lake, at the bottom of which considerable silver was found in the wash. A shaft has been sunk 70 feet deep and drifts run north and south on the lead 10 and 15 feet respectively. Nearly all the work during the summer was in surface prospecting.

King Cobalt Mine

Just southeast of the Watts and Allen mine on the northwest part of lot 2, concession 5, Coleman, a tunnel 70 feet in length has been driven into the hill; considerable surface prospecting has also been done.

Nova Scotia Mine

This mine is on the southwest part of the north half of lot 3 in the fifth concession of Coleman township, and adjoins the Watts and Allen on the southwest. It is owned by the Star Silver Cobalt Mining Company, in which Messrs. Steindler of New York, and J. A. Jacobs of Montreal are largely interested. The shaft, 10 by 4 feet inside timbers, has been sunk 54 feet on the vein and a drift run east 80 feet. A raise has been put through 64 feet east of the shaft on the vein.

The surface plant is all under one building, and includes a 50-h.p. boiler, an 8-h.p. Jenckes hoist and a four-drill Rand compressor. On this property the shaft house is connected with the boiler house. This is dangerous on account of fire and is contrary to the Mines Act.

Mr. J. B. Woodworth is superintendent, employing a force of 15 men.

Peterson Lake

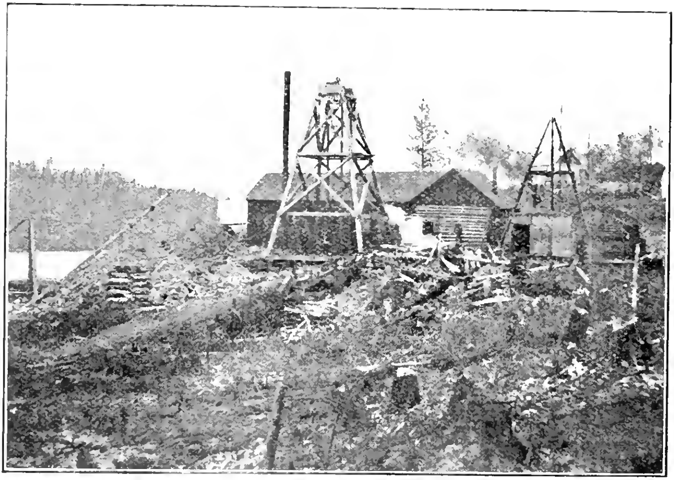
The Peterson Lake Silver Cobalt Mining Company have acquired the right to lower the waters of the Peterson lake 15 feet and have begun to cut an outlet 1,000 feet in length from the north end of the lake, draining it into Farr creek. This will

Peterson lake; Nipissing Mining Company's pumping plant.

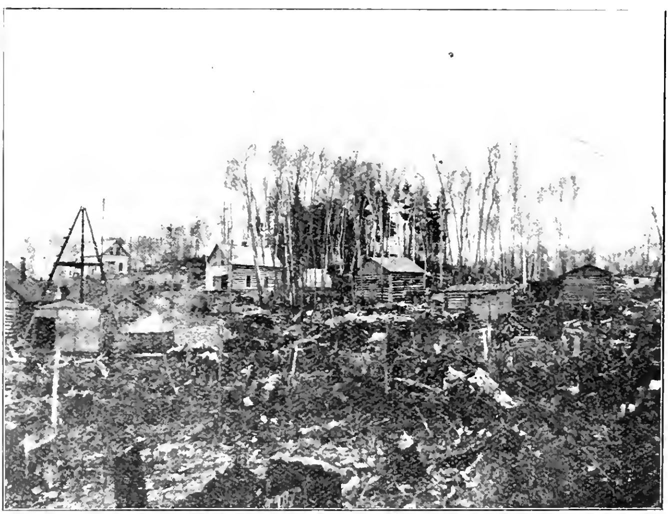
completely drain Cart lake, which is only 8 feet in depth and will expose a great deal of Peterson lake, which is quite shallow. Mr. J. B. Woodworth has a force of 16 men employed in cutting out the trench.

Drummond Mine

This mine is situated on the northwest quarter of the north half of lot 2 in the fourth concession of Coleman township, and was the second mine to be opened up in the Kerr lake district. The mine is owned and operated by the Drummond Mines, Limited.



Drummond silver-cobalt mine, Kerr lake at the left.



Drummond silver-cobalt mine : camp buildings.

whose superintendent is R. W. Brigstocke, employing a force of 35 men. Three veins have been opened up, two of which are parallel, about 7 to 12 feet apart. A shaft 5 by 9 feet inside timbers has been sunk on these two veins, and to the north of the shaft on the surface the ore has been taken out by open cutting. The open cut is 80 feet long, 30 feet deep and 12 feet wide. On the "Bluejay" vein, which is about 100 feet northeast of the above mentioned veins, a shaft has been sunk 25 feet and an open cut run for some 50 feet along the vein for a few feet in depth.

The compressor and boiler house is located about 60 feet east of the shaft. The surface plant consists of an air compressor delivering 300 feet of air per minute, two 50-h.p. locomotive firing boilers and a 15-h.p. hoist. The company have also a diamond drill working on the property testing the vein at depth.

Jacobs Mine

The mine is located on the northeast part of lot 4 in the fourth concession of Coleman, and was the first property on which smaltite and silver was found in the Kerr lake district. It was located in the fall of 1904, and was bought from the original locatee by the Kerr Lake Mining Company, of which E. J. Steindler of New York is president, J. A. Jacobs, secretary-treasurer, and Robert Jacobs, manager.

The vein on which work was first done is on the shore of Kerr lake, and has been open cut to within a few feet of the level of the lake. In the spring of 1905 a new vein was discovered on the southeast corner of the lot. This vein occurs in the diabase formation running north and south, and there are high silver values in the calcite which is the vein filling. A drift 200 feet in length has been run into the hill and the ore in the vein above this drift stoped out. This stope averages 30 to 35 feet in height. Another vein has been discovered in 1906 on the northwest part of the property on Kerr lake. This vein is very rich in native silver and argentite.

At the south vein a 60-h.p. boiler, 4-drill air compressor and hoist have been installed. Sinking on this vein at the mouth of the tunnel is in progress, 60 feet having at present been sunk.

Mr. S. W. Cohen is superintendent, employing at present about 30 men.

Hargrave Mine

On the northeast 50 acres of the south half of lot 3 in the fourth concession of Coleman, Messrs. Hargrave and White opened up the extension of the Jacobs south vein in 1905. Owing to legal difficulties regarding the title no work has been done on the property this year. The vein has been open cut for a depth of 30 feet along the vein for 100 to 125 feet. A shaft has been sunk 75 feet west of the vein and a drift run to the vein on this level. No other work has been done on the property with the exception of trenching and cross-cutting for new vein. Camp building consisting of dining room, bunk house, office and laboratory have been constructed on the lot adjoining.

Mr. C. O'Connell is superintendent of the property.

Rothschild Mine

On the southwest quarter of the south half of lot 3 in the third concession of Coleman, the Rothschild Cobalt Mining Company have worked for the last year and have developed their property by sinking a 75-foot vertical shaft, and at this level running a cross-cut to intersect the vein. In addition to the mining work a good deal of surface prospecting is being done. A boiler and hoist have been installed.

Jos. Herman is superintendent, employing a small force.

Lawson Mine

On this mine, which is on the southwest quarter of the north half of lot 4 in the third concession of Coleman, very little work has been done owing to legal difficulties in connection with the title. In 1905 two shafts were sunk on the vein 45 feet and 34 feet deep respectively. At the bottom of the 45 foot shaft a drift was run north 30 feet. On the main vein ore has been mined by means of an open cut from 4 to 12 feet deep and 79 feet in length.

Camp buildings, Hargrave and White's claim, Coleman.

Silver Leaf Mine

The present owners of this mine, which is situated on the northwest quarter of the north half of lot 3 in the fourth concession of Coleman, are the Silver Leaf Mining Company. The property was bought and put on the market by Douglas, Lacey and Company of New York

One shaft has been sunk to a depth of 45 feet and closely cribbed for 25 feet. The ore in the first 10 feet of the vein from the surface has been taken out by open cut work. Another shaft near the shore of Kerr lake has been sunk 40 feet, and drifts have been run east and west on the vein 10 feet and 20 feet respectively. Another vein at right angles to the other two is being worked by means of an open cut which at the time of inspection was 10 feet deep and 50 feet long. Considerable surface prospecting is being done.

Two 40-h.p. boilers, a 5-drill Rand air compressor, hoist, drills and pumps have been purchased and new camp buildings put up. Mr. W. B. Clark is superintendent, employing a force of 25 men.

Foster Mine

In the spring of 1905 smaltite and silver were discovered on the southeast quarter of the north half of lot 4, in the fourth concession of Coleman by Mr. C. A. Foster. This property was subsequently transferred to the Foster Cobalt Mining Company, Mr. C. A. Foster being president. During 1905 a number of cars of high grade ore were shipped,

the ore having been taken out by means of open cut work. No. 1 pit and open cut where the discovery was made is 20 to 25 feet deep and about 100 feet in length. The shaft sunk from the open cut has a depth of about 40 feet. This shaft is on the shore of Glen lake on the southwest corner of the property. No. 2 shaft has a depth of 80 feet and is close cribbed to the bottom. Drifts are being run at the 40-foot level. No. 3 pit is an open cut 25 feet in depth, 30 feet in length and 12 feet in width. No. 4 pit on the east side of the property is 25 feet deep and 60 feet in length. A number of other veins have been uncovered, but are not being worked at present.

Camp buildings consisting of dining room, bunk house and office have been erected, but no machinery has as yet been installed.

Mr. J. G. McMillan is superintendent, employing a force of 25 men.

University Mine

This mine is situated on the property south of the Foster mine, being that portion of lot 4 in the fourth concession of Coleman, consisting of 43 acres immediately north of Giroux lake, and also a portion of the bed of the lake, known as mining location J B 8, containing 13 acres. The original owners were Messrs. W. J. Blair, H. L. Kerr and George Glendinning, but the property was subsequently transferred to the University Mines, Limited. The shaft on one of the main veins has been sunk to a depth of 80

University silver-cobalt mine, camp building.

feet and at the 60-foot level drifts have been run 10 feet northeast and southwest. From the southwest drift a cross-cut is being driven northwest, a distance of 50 feet having now been attained. Northeast of this pit on the top of the hill a shaft has been sunk on another vein to a depth of 50 feet, and a drift is being run east on the vein to open up the continuation of a rich part of the vein that was uncovered on the surface. In addition to the mining work, a good deal of prospecting is being done on different parts of the lot. A couple of carloads of high grade ore have been shipped.

A 20-h.p. boiler and hoist have been installed on number 4 vein, and a compressor plant been ordered and will be put in without delay. A dining and sleeping camp 60 feet by 45 feet has been erected. Mr. G. Adler is superintendent, employing a force of 40 men.

Silver Bar

This property is the southwest part of the north half of lot 5 in the fourth concession of Coleman, and was located in 1905 by Mr. C. W. Knight, and sold by him to the Silver Bar Mining Company, of which Mr. Rinaldo McConnell of Ottawa is president, and J. B. Woodworth, superintendent. A shaft has been sunk on the vein to a depth of 45 feet. The vein was open cut for 30 to 40 feet and for a depth of 12 feet A boiler, compressor and hoist have been installed.

Savage Mine

This property, adjoining the Silver Bar to the north, is situated on the northwest quarter of the north half of lot 5 in the fifth concession of Coleman. It was located in 1905 by Mr. R. E. Savage of Sudbury, and sold by him to the Savage Mines, Limited. A couple of small parallel veins have been opened up, and a shaft 70 feet in depth sunk on one of them. Drifts have been run southeast a distance of 40 feet and northwest 15 feet. From the northwest drift a cross-cut 25 feet in length has been run. A 50-h.p. boiler, 3-drill compressor and double drum hoist have been installed. Mr. A. Sampson is foreman, employing 14 men.

On the southwest side of "Diabase Mountain" Mr. Howard Chapin has been prospecting by driving a tunnel into the mountain on the contact between the slate and diabase. A tunnel 105 feet in length has already been driven. Power is supplied by means of a gasoline air compressor.

Temiscamingue Mine

On the south half of the northwest quarter of the north half of lot 1 in the third concession of Coleman, the Temiscamingue Mining Company have this year made a discovery of smaltite averaging over 1 foot in width, as far as uncovered. A shaft is being sunk on the vein and at a depth of 40 feet argentite was found. This vein has been traced across this property to the north half of the lot.

Beaver Mine

On the north half of the northwest quarter of the north half of lot 1 in the third concession of Coleman, the vein on which the Temiscamingue Mining Company are working on the lot south of it, has been uncovered and found to contain native silver. The property is owned by the Beaver Mining Company.

Columbus Mine

On the northwest quarter of the south half of lot 2 in the third concession of Coleman, the Columbus Cobalt Mining Company are opening up a vein of cobaltite. The property was located in 1905 by Joseph Columbus. A large number of very fine crystals of cobaltite have been found in the vein. Mr. Harms is foreman, employing a force of about 25 men.

Benn Mine

On lot 15 in the first concession of the township of Bucke on the shore of lake Temiskaming, the Temiskaming Cobalt Mining Company have been working a vein of cobalt. A shaft has been sunk on the vein a depth of 60 feet, and two diamond drill holes put down to cut the vein at depth. The property was purchased from Mr. Ira L. Benn, who discovered the vein in 1904.

Red Rock Mine

This property is owned by the Red Rock Mining Company and was purchased from Mr. Robert McBride. It is situated on the northwest quarter of the south half of lot 14 in the first concession of Bucke township. An open pit has been sunk to a depth of about 50 feet, and a great deal of surface prospecting done. A small boiler and hoist have been installed on the property.

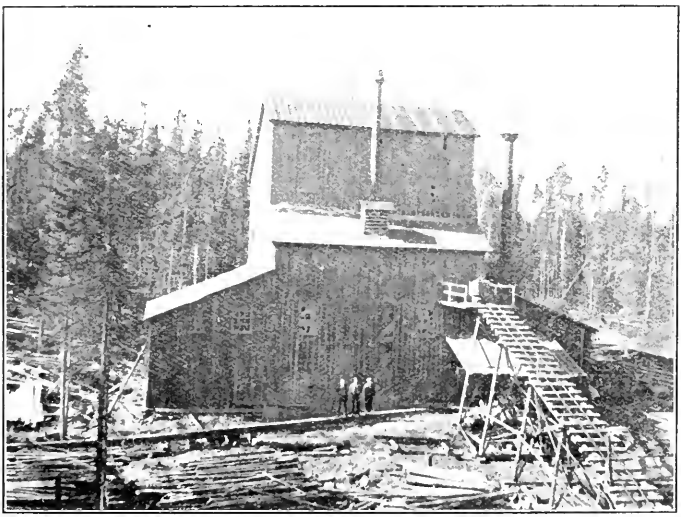
Edison Cobalt Mine

This is mining location J B 33 west of Bay lake, and is owned and operated by Mr. Thos. A. Edison of New Jersey. Development work began in the fall of 1905 under the direction of Mr. Horace L. Wilson. Two shafts have been sunk to depths of 60 feet and 40 feet respectively on small veins of smaltite. A boiler and compressor have recently been installed.

OTHER MINERALS

Temagami Mining and Milling Company

On mining location W D 271 at Grey's siding, in the Temagami Forest Reserve, and about 3 miles north of Temagami station, the Temagami Mining and Milling Company have put up a concentrating mill for treating the ore from the Big Dan mine. Very



Concentrating plant, Big Dan gold-arsenic mine.

little mining or development work has been done, the ore milled having been taken out of an open cut 18 feet wide, about 30 to 35 feet high and 20 feet long. The ore is arsenopyrite, and outside of the veins is disseminated through the country rock, which is milled.

The ore is hoisted from the open cut by a skip and dumped into a Blake jaw crusher. The product is then dried, and is passed through rolls and elevated to trommels for sizing. The oversize passes down through a fine roll. The sized product is then put through Kriem air separators, of which there are three in the mill. The concentrates from these separators are drawn off and bagged for shipping. It is the intention of the management to do away with dry concentration and put in a plant using the wet process. Mr. Albert Smith is general manager, employing when operating, a small gang of men.

Little Dan

At Arsenic lake, about 3 miles west of Grey's siding, Captain J. Leckie has a small gang of men at work on mining locations W S 13, 14, W D 460, 461, 462, 463, 464 and 465. Nothing is being done at present at the Little Dan, which is an arsenopyrite property. The vein has been opened up for some distance on the surface, showing there from 3 to 4 feet of good ore in addition to the impregnated country rock.

On the north and south side of Arsenic lake some prospects carrying copper pyrites are being developed. Camps have been built on the shore of the lake.

James Lake Pyrites Mine

At James lake, about 8 miles north of Temagami on the Temiskaming and Northern Ontario railway, an iron pyrites deposit is being opened up under the management of Ronald Harris. A shaft has been sunk 60 feet and some very good ore shipped. A boiler hoist and compressor have been installed.

Temagami Iron Range

On the iron range near Temagami Messrs. Caldwell and Mulock are engaged in exploratory work. Diamond drilling, trenching and cross-cutting the ore body are being carried on. The work is in charge of Mr. A. B. Willmott of Sault Ste. Marie.

IV.—Eastern Ontario

GOLD MINES

The gold mining industry of eastern Ontario remains in about the same condition as for the last few years. The Belmont and Deloro mines have not as yet resumed operations, although the high price of arsenic should tend in this direction at the latter. A little bullion was produced at the Craig and the Star of the East, but the mills at these mines are only run at intervals, as development work has not proceeded far enough in advance of stoping operations to ensure a uniform production. These spasmodic attempts at turning out gold are due, as has been pointed out in former reports, to the undue haste in the erection of stamp mills before the mine is sufficiently developed. This has been the chief cause of giving gold mining a set-back in all parts of Ontario, and it is chargeable in part to the flotation of stock companies and the desire of the promoters to have something tangible on the surface to show the public, and also in part to the undue haste of shareholders to obtain dividends.

Gold mining in eastern Ontario dates back to 1867, when the Richardson Hill discovery at Eldorado caused a rush of miners and prospectors to this centre. Since that time gold has been found in North Hastings and Frontenac at many places, but no very extensive development work has been carried on, on any of the properties with the exception of the Belmont and Deloro mines.

Craig Gold Mine

This property is situated on the south half of lots 4 and 5 in the third concession of the township of Tudor, Hastings county, about eight miles north of Bannockburn station. The owners are the Craig Gold Mining and Reduction Company of Phelps, New York, with Mr. H. B. Whitney, president and manager, and Mr. F. D. Burgess, treasurer.

No. 1 shaft on which all work is being carried on at present, is 150 feet in depth. The fi st level is at a depth of 60 feet, and a drift some 400 feet in length has been run northwest from this level to connect with No. 2 shaft. About 30 feet northwest of the shaft the ore has been stoped out for a distance of 75 feet along the vein and 30 feet in height. The drift southeast on this level is 50 feet in length, and has been stoped out for a height of 30 feet.

On the second level, which is at a depth of 150 feet, drifts have been run in both directions on the vein for about 25 feet. Timber is cut for a new skip and ladder-way in the shaft. No. 2 shaft northwest of No. 1 shaft and connected with it, is 110 feet deep, with no drifting except on the 60-foot level.

The mill was completed last year and about 2,000 tons of ore milled. The plant consists of a Merrall mill with two batteries of three stamps each and two Wilfley tables. The concentrates from the ore contain in addition to the gold, from 1 to 1.5 per cent. of copper. None of the concentrates have been shipped as yet, but owing to the erection of a copper smelter at Eldorado there should be no difficulty in securing a market, since they would be a desirable aid as a flux in smelting the copper ores there. A force of 12 men are employed under foreman D. McKinnon.

Star of the East

This mine was closed for some time last year owing to changes in the company and the management, Mr. J. K. Dale being now president and general manager, and Mr. Thomas Jackson foreman. A force of 12 men is employed. The shaft, 16 by 11 feet in plan, has been deepened to 213 feet. At present work is concentrated on the 200-foot level, where a cross-cut is being driven north to intersect what is called the north vein some 100 feet from the present shaft. The cross-cut has now been driven 80 feet. This north vein is a parallel vein to the old one occurring in the crystalline limestone. The cross-cut has all been in the crystalline limestone. The contact with the diorite occurs about half a mile north of the mine. In the bottom of the shaft in the old vein, lenses of quartz occur, highly impregnated with iron pyrites. The first level at a depth of 35 feet has a drift running east 42 feet. The second level at a depth of 74 feet has a drift east on the vein 48 feet and west 54 feet. Thirty feet east of the main shaft on this level a cross-cut has been run north 47 feet. On the third level at a depth of 108 feet drifts have been driven west 22 feet and east 8 feet.

The mill, which consists of ten stamps, was closed down in January, and has not since been in operation. During last year 1,050 tons of ore were milled. In addition to the mill, a compressor plant manufactured by the Gardiner-Govenor Company of Quincy, Illinois, was put in, together with engine to drive the same, and two locomotive firing boilers of 40-h.p. capacity each. The compressor is at the mill, which is about three-eighths of a mile from the mine. Water for milling purposes and for the camp is brought in pipes from a lake about a mile from the mine by gravity.

Instructions were given regarding riding in the bucket and also with regard to ladder-way and shaft.

Big Dipper Mine

About three miles west of the Star of the East mine and three-eighths of a mile west of Massasaga lake, the Big Dipper Mining and Milling Company have been at work

for the past year. The head office of the company is at Peterborough. The president is Mr. John Fletcher, general manager Mr. J. Jamieson, and foreman Mr. Robert Wilson. A force of 12 men is employed.

During last year on lot 4 in the tenth concession of the township of Barrie, the company drove an adit into the hill about 300 feet. This is not being worked at present. The camp buildings are on Massagaga lake near where the work was done. On lot 12 in the same concession a shaft is being sunk and prospecting carried on. The shaft, 9 by 6 feet in plan, has reached a depth of 62 feet, and is cribbed and the ladder-way partitioned from the shaft for 40 feet. About 100 feet west of this shaft another shaft has been sunk on the same vein 30 feet. The vein runs east and west and is composed of quartz carrying iron pyrites and magnetite. The magnetite occurs in the hanging wall in contact with the crystalline limestone. The granite outcrops about 30 feet north of the outcrop of crystalline limestone. The rock between the granite and limestone is very much altered, but is chiefly a granite gneiss. The hanging wall or wall of crystalline limestone dips nearly vertical for 20 feet, then at an angle of 75 degrees. Some free gold is found in the quartz near the surface. A small horizontal boiler furnishes steam for hoist and pump.

The company is interested in lots 4 to lot 21 in the tenth concession of the township of Barrie, Frontenac county.

Eldorado Copper Mine

This mine, which was originally opened for iron, but which has for the last couple of years been worked for copper, is owned by the Medina Gold Mining Company of Syracuse, with Mr. Cole Saunders, president, and Mr. Arthur Coe, mine manager. The ore is chalcopyrite and was found at a depth of 75 feet displacing the hematite, which constituted the ore body to this depth. Some very fine samples of chalcocite are also found in the ore. The north or hanging wall of the ore body is granite, and the south or foot wall crystalline limestone. The ore body runs east and west in a wide open fissure in the contact between the granite and limestone. The open cut worked for iron is 75 feet in depth. From this level a shaft has been sunk 75 feet with drifts and cross-cuts at different levels. At a depth of 35 feet in the shaft a level has been driven, and 105 feet of drifting done. Twenty feet deeper in the shaft, another level has been run and 170 feet of drifting done. At the 75-foot level there are 175 feet of drifting. The ore body, which occurs as a shoot, dips to the northeast. At the lower level drifts have been run into it and sinking on it has begun. It is the intention to put down a winze on the ore body following its dip.

The plant consists of one 60-h.p. locomotive firing boiler, one 110-h.p. return tubular boiler, one 4-drill air compressor and an 8 by 10-inch duplex cylinder hoist with 36-inch drum. Hoisting is done by swinging arm derrick with guy ropes to enable it to deliver ore at the smelter or stock pile, or waste at the car, to be trammed to the rock dump A 70-light dynamo supplies light to the mine, smelter and camp building. Two pumps—a 28-gallon Cameron and a 50-gallon Knowles—keep the mine free from water. The company has also erected a large boarding house and office.

In addition the company have purchased a diamond drill manufactured by the Standard Drill Company of Chicago, for use in prospecting their property. The drill has a capacity of 800 feet with a core fifteen-sixteenths of an inch in diameter. The drill is at present boring a hole to cut the ore body at a depth of about 300 feet.

The first copper smelter in eastern Ontario was blown in at this property on June 25th, 1906. The furnace is south of the mine on the side of the hill which furnishes ample ground for slag dump, and is so situated that the swinging arm derrick used for hoisting ore from the mine dumps the ore at the door leading to the charging floor. The furnace is 4 feet in diameter, round, water jacketed, manufactured by the Allis Chalmers Company of Chicago, is equipped with the regular style of settler, and has a capacity of about 50 tons per day. The height from base of furnace to charging floor is 12 feet.

The ore, averaging from 4 to 10 per cent. copper, is smelted green. The fluxes, consisting of limestone and quartz, are obtained only a short distance from the mine. Matte running from 15 to 25 per cent. copper is obtained in the first operation. It is the intention to run the matte through the furnace again separately in order to raise the copper contents from 40 to 45 per cent. The superintendent of the smelter is Mr. Barclay.

LEAD AND ZINC MINES

Hollandia Lead Mine

At the time of my inspection of this property in April, the mine was full of water, but since that time it has been re-opened and mining again begun. Arrangements are being made to have the property taken over from the Ontario Mining and Smelting Company by the Stanley Smelting Company. Mr. Cushman is manager for the two companies. No. 1 shaft has been sunk to a depth of 100 feet and 50 feet of drifting done along the vein in each direction. No. 3 shaft, 250 feet west of No. 1 shaft, is 45 feet deep. No. 4 shaft, some 250 feet west of No. 3, has a depth of 35 feet. A new lift pump worked by walking beam and engine was put in last year. The concentrating mill was overhauled last year and the concentration is now wholly by means of jigs, where before tables were used for the final separation. Considerable ore was run through the mill last year and shipped to the lead smelter at Bannockburn.

Instructions were given regarding putting ladder-way in proper condition and forbidding riding on the bucket.

Katherine Lead Mine

This mine was worked some years ago and is situated on lot 7 in the second concession of the township of Lake, Hastings county, three miles northwest from Millbridge. It has recently been taken over from the British Colonial Mining and Development Company of Ontario, Limited, by the Stanley Smelting Company, and unwatered, and mining operations have been resumed.

The shaft is 125 feet deep, and on the 100-foot level has 100 feet of drifting to the north of the shaft. The present company are installing an air compressor and putting the old plant in good condition.

Stanley Smelting Works

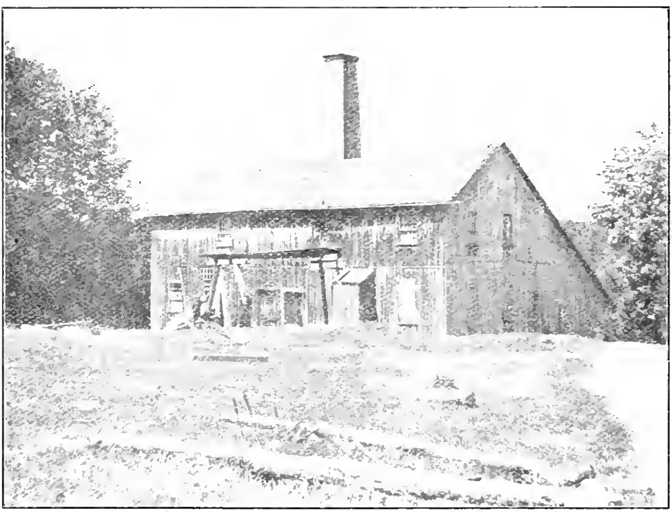
The lead smelter owned and operated by the Stanley Smelting Company was constructed in the spring of 1905, and has been in operation more or less continuously since that time. It is situated at Bannockburn, at the junction of the Central Ontario railway and the Bay of Quinte railway, thus giving good communication in every direction. It is a water-jacketed lead furnace of about 20 tons capacity per day.

A gasoline engine furnishes power to drive the blower and centrifugal pump. The iron ore used for a flux is obtained from the Wallbridge mine, which is between Eldorado and Madoc. The silica comes from the immediate vicinity of the works. The superintendent of the smelter is Mr. W. Weigel.

Frontenac Lead Mine

About one mile northwest of the old works of the Frontenac lead mine, near what was formerly known as the Frontenac lead mine No. 2, more work was done in 1905. The ore is, as shown in last year's report, a mixed ore of galena and zincblende. The vein on which the work has been done has a strike of northwest by southeast, and has been traced for a considerable distance; in fact it appears to be the same vein as that on which the shaft No. 2 was sunk.

Lead smelter at Bannockburn.

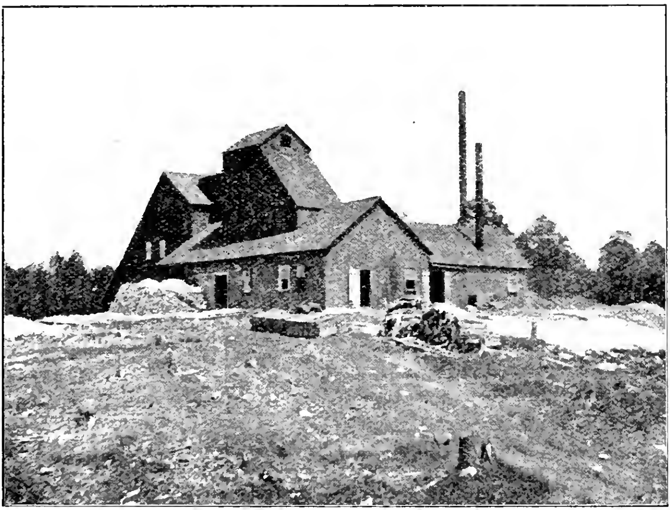


Old concentrating mill at Frontenac lead mine.

Richardson or Olden Zinc Mine

The new shaft, 7 by 9 feet in plan, on this property has now reached a depth of 120 feet. At the 65-foot level drifts have been run east and west 25 and 50 feet respectively, and ore has been stoped out of these drifts to a height of 20 feet. In the west heading on this level the vein is one foot in width, and appears to be widening. Work is also being done in No. 2 pit, which has a depth of 40 feet and a length of 50 feet along the vein. No. 1 pit is 109 feet in depth, but was not being worked at the time of inspection.

The mill, which was built in 1905, was equipped with crusher, rolls and bucket elevators to storage bin, screens and three Bartlett tables. The tables were not satisfactory for the treatment of this particular kind of ore, and have been taken out. The ore is now being concentrated by means of hand jigs, four of which are in use. One of these jigs operated by two men produce three-quarters of a ton of concentrates per day. No effort is made with the hand jigs to separate the zinc and lead. There is a great deal of this low grade ore lying on the dumps ready for treatment.



Mill at Olden zinc mine.

The plant consists of two 30-h.p. boilers, one 2-drill straight-line air compressor and a double-drum hoist hoisting from both No. 2 pit and new shaft. Hoisting from the new shaft is by means of head frame, and from No. 2 pit by derrick. The plan of building shaft house, mill and power house under one roof is very dangerous and is now forbidden by the Mines Act, 1906. Instructions were given regarding the building of a house in which to thaw the dynamite. A force of 25 men were employed under foreman J. Sullivan.

The ore in this mine is zincblende, intimately associated with galena occurring in the crystalline limestone. Iron pyrites and a variety of greenstone having a high specific gravity occur as impurities.

Another zinc property is being opened up by Messrs. Kirkgaarde and Chisholm about two miles west of the Richardson zinc mine. A few men are at work on a narrow seam or lens of zincblende.

IRON PYRITES

The interest taken in the production of iron pyrites in eastern Ontario has increased to such an extent that the business is now on a firm basis, and shipments of ore from the mines are being made regularly. The largest producers are the American Madoc Mining Company.

American Madoc Mining Company

This company are operating two properties, the Jarman pyrites mine and the Hungerford pyrites mine. Both are under superintendent Mr. A. F. Rising.

At the former the shaft has been sunk 55 feet below the third level, making a total depth of about 230 feet. All work since last inspection has been confined below the third level. Here a drift was run north under the pillar which forms the third level floor a distance of 175 feet and a raise put through to the third level, access to this level being gained through the raise. About 30 feet of the floor of this drift has been stoped out by overhand stoping, and another 25-foot stope begun. The ore body dips to the north, thus leaving the shaft to intersect the south wall at the present depth. A dam and reservoir for catching all the water from above the third level has been put in on this level, and a large Cameron pump installed. The water from the lower workings is pumped to the reservoir. Instructions were given to have additional landings in the ladder-way put in and the hoisting way separated from the ladder-way, also to strictly enforce the law prohibiting men riding on the bucket. A force of 30 men are employed under foreman Mr. T. E. Burnside.

At the Hungerford pyrites mine on lot 23 in the twelfth concession of the township of Hungerford, about 5 miles east of Tweed, a shaft 6 by 12 feet has been sunk a depth of 250 feet on the south vein. The first 50 feet of the shaft is on an incline of 79 degrees, and from there to the bottom at an incline of about 57 degrees. The first level at a depth of 100 feet on the south vein has drifts east 137 feet and west 35 feet, and on the middle vein east 18 feet and west 75 feet. From the south vein a cross-cut 115 feet in length cuts the north vein, which is some 20 feet in width and has drifts east 142 feet and west 175 feet. The second level, at a depth of 200 feet on the south vein, has drifts east 45 feet and west 25 feet. A cross-cut 175 feet in length from this to the north vein cuts 16 feet of ore. The shaft is sunk 50 feet below this level and sinking is being continued. The ore is a fine granular pyrites, very free from rock matter, but containing some calcite. The hanging wall of the vein is a mica schist and the foot wall a quartzite.

The surface plant consists of an 80-h.p. return tubular boiler with feed water heater, a four-drill Ingersoll-Sergeant air compressor, and duplex cylinder 8¼ by 10-inch Lidgerwood hoist with 2½-foot drum. The shaft house is 55 feet high with 31 by 26-foot base. The upper part of the shaft house is used as a sorting and breaking floor, while the lower part is not boarded in. A blacksmith shop and dry, compressor and boiler house and office, comprise the rest of the surface equipment.

British American Mine

The British American Pyrites Company, Limited, of Toronto, are still working on lot 11 in the 11th concession of Madoc township, under superintendent Captain Williams. The shaft has been sunk to a depth of 80 feet, and at the 60-foot level a drift has been run in, and the floor blown up to provide a sump where a large sinking

pump is installed. Two locomotive firing boilers having a combined capacity of 110-h.p., and a 3-drill straight-line air compressor have been installed, and also a small hoist. During the winter some 30 cars of ore were shipped from the mine. No stoping has yet been done, consequently the ore shipped was obtained from the development work.

IRON MINES

Radnor Mine

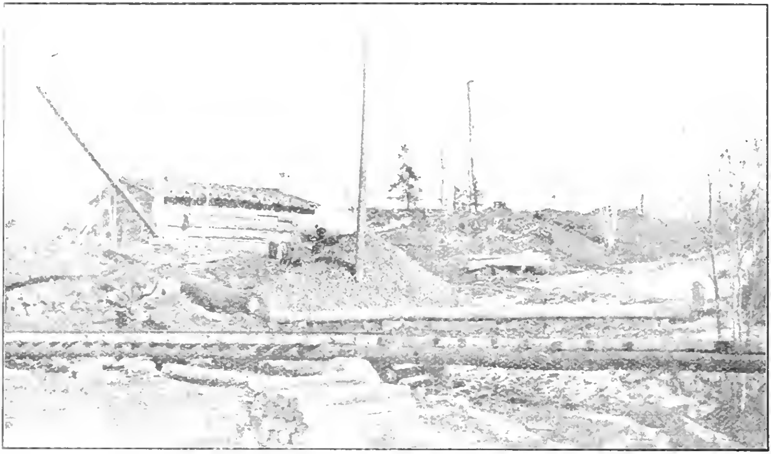
The Radnor mine owned by the Canada Iron Furnace Company was the only steady producer in 1905 in the eastern part of the Province. The new road to the railway, three and a half miles in length, has been completed, and it is expected by the management that 5,000 tons will be shipped during the present year. All work is at present being done on No. 8 pit, which is situated on the more northerly part of the property. On account of the ore body occurring in beds which vary in thickness and dip at an angle of about 34 degrees, the work of mining is difficult and costly. As the upper bed lies immediately under the surface covering, it has to be mined by open-cut work, which necessitates the removal of a great deal of waste material. The beds are in places 8 feet thick, with granite and granite gneiss intervening. The ore is sorted into two grades, that running from 48 to 50 per cent. iron is shipped, while the second grade material of about 30 per cent. is put on the stock pile. There is a large tonnage of this second grade ore which could be quite economically treated by magnetic concentration.

The office was destroyed by fire during the last winter. The mine is now connected by telephone with Caldwell on the Canada Atlantic Railway. A force of 20 men are employed under superintendent Mr. D. J. McCuan.

Mineral Range Mines

The Mineral Range Iron Mining Company own the properties called No. 2 and No. 3 mines, situated on lots 2 and 3 in the sixth concession, and the Childs mine on lots 11 and 12 in the ninth concession of the township of Mayo, county of Hastings, about 5 miles by road from L'Amable station on the Central Ontario railway. Mr. H. C. Farnum is mine manager.

A railway line is being put in this summer from No. 3 mine to connect with the Central Ontario railway a short distance south of L'Amable. It is expected that the line will be completed about the first of September, when contracts call for large shipments of ore. No. 3 mine is to be the property first developed extensively. In this mine the ore is coarse grained and free of visible sulphides, though containing a little lime. The ore body has been stripped for a width of about 50 feet and 300 feet in length. Mr. Farnum states that the dip needle shows the ore body to be at least double this width and length. The ore has been opened at the foot of the hill over which the magnetite extends, thus giving a stope above the level of the ground at least 25 feet in height by the width of the ore body. The wall on the east side of the ore body is very clearly defined, but that on the west side has not yet been encountered. A band of greenstone three or four feet wide comes in about 25 feet from the east wall; also some granite dikes cut across the ore body in places. No. 3 body appears to be almost a continuation of No. 4, which has also been opened up for about 30 feet in width by 40 feet in length and 20 feet deep. No. 4 has been shown by the dip needle to be nearly 100 feet wide by 500 to 600 feet long.



Mineral Range Iron Mining Company: No. 4 mine.

Mineral Range Iron Mining Company, No. 4 mine, looking east.

A portable boiler has up to the present furnished power for the hoist and machine drill. Hoisting is by derrick.

The following assays furnished by Mr. Farnum show the character of the ore body.

No. 1. Result of shipment of 50 tons to the Tonawanda Iron and Steel Company.

No. 2. No. 3 pit (stock pile) sampled and analysis made by Mr. W. Dixon Craig for Canada Iron Furnace Company.

No. 3. No. 4 pit sampled and analysis made by Mr. W. Dixon Craig for Canada Iron Furnace Company.

	No. 1.	No. 2.	No. 3.
Iron	63.8	64.94	64.23
Silica	5.15	4.74	5.79
Phosphorus	.024	.006	.013
Manganese	.085	.27	.12
Alumina	.35	.62	1.40
Lime	2.70	2.86	2.43
Magnesia	1.24	1.48	1.55
Sulphur	.076	.007	.007

CORUNDUM MINES

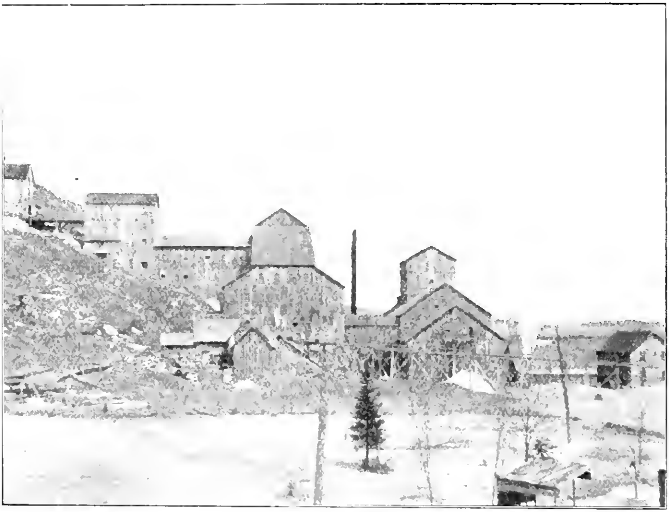
Canada Corundum Company

The system of quarrying the corundum-bearing rocks described in former reports of the Bureau is still being continued, but on a much larger scale. The whole face of the hill is being uncovered and prospected by means of drills, etc. To handle the ore from the upper workings on the hill, a system of balanced hoisting somewhat similar to the main and tail rope haulage system is used. A double track is carried up the side of the hill from the lower track to the top of the hill. Here a large drum with powerful friction brake is situate. The cables are fastened to the cars on each of the tracks, the other ends being attached to the drum and one rope winding on the drum in the reverse direction from that of the other. In this way the loaded car pulls up the empty, the speed being regulated by the friction brake. From the track at the foot of the incline track, the ore is hauled by team to the storage bins at the mill. The workings are so extensive all over the face of the hill, that the cost of mining is greater than it would be if the work could be concentrated at one place.

One noticeable improvement in the operation of the mill is the milling of a much lower grade of ore than formerly. A great deal of the corundum-bearing rock formerly considered too low grade for economic treatment is now being put through the mill. During the winter some work was done on a prospect two miles from the main workings on the same ridge.

The mill is at present handling a tonnage of about 200 tons of ore per day, and producing over 300 tons of refined corundum per month. There is also an increase in the number of grades of corundum produced. A full description of the mill is given in former Reports of the Bureau. There have been some changes, but they are in details rather than in principle. The present manager has by some slight alterations increased both the capacity and efficiency of the magnetic separations.

Mr. H. E. T. Haultain is manager, employing a force of over 200 men. About 10 miles from Craigmont in the township of Monteagle above Foster's Rapids, the company have 10 men employed in exploratory work.



Canada Corundum Company's mill, Craigmont.

Canada Corundum Company ; workings on hill side.

Ashland Emery and Corundum Company

This company, successors of the Ontario Corundum Company, are now prospecting on lots 15 and 16 in the thirteenth concession of the township of Carlow. Work was begun under superintendent W. Mackie on January 1st, 1906. Open cut work is being done on the hill at an elevation of about 400 feet above the mill and east of it. The

Ashland Emery and Corundum Co's mill.

mill formerly owned by the Ontario Company has been taken over, and the corundum-bearing rock is being milled. The mill was put up in 1904 immediately after the old mill had been destroyed by fire, and is described in the last Report of the Bureau of Mines. The Armstrong property was worked by this company until June 1st, 1905.

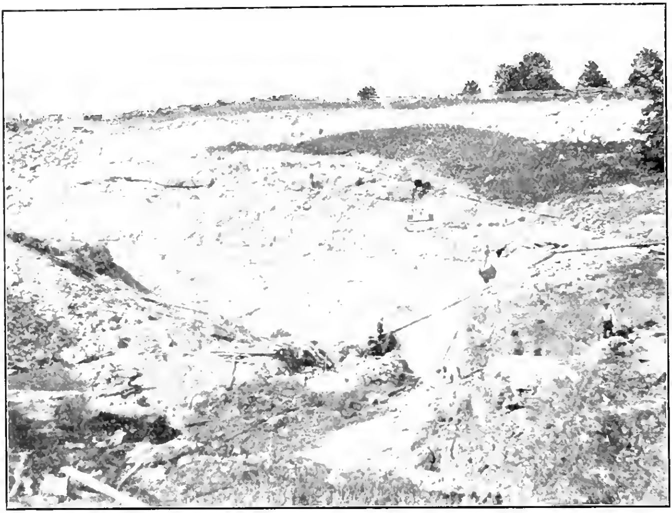
The National Corundum Wheel Company, with head office at Buffalo, have done some development work on their property on lot 13 in the first concession of Monteagle township. The corundum-bearing rock is hand picked and the high grade material is shipped to Springfield, where it is refined. Mr. George W. Weese of Bancroft is looking after the development work for the company.

FELDSPAR MINES

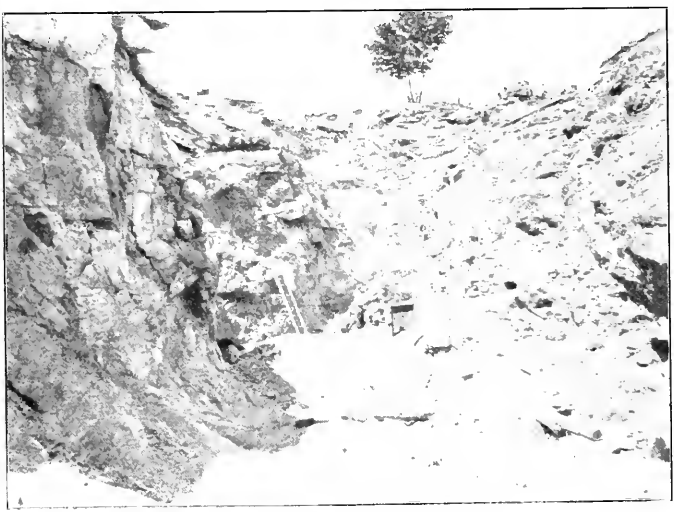
The production of feldspar is increasing yearly. Feldspar properties are in demand, but are saleable only if near transportation facilities. Consequently fairly good outcrops of feldspar have not been exploited owing to their distance from a railway. The activity in the building of railways will tend to open up many more good properties.

Richardson Mine

This mine, owned by the Kingston Feldspar Company, is still the chief producer of feldspar in Ontario and conditions at the mine indicate that it will be a heavy shipper



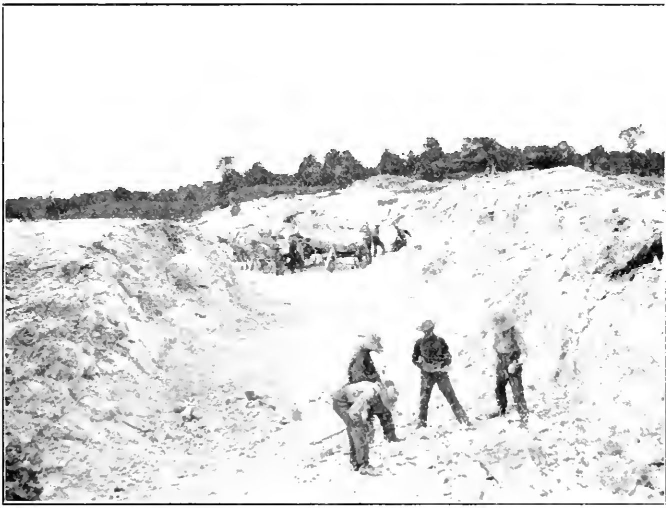
Richardson feldspar mine.



Richardson feldspar mine; No. 2 pit.

for some time. The output from the mine is now about 130 tons per day. The system of haulage from the mine to the Glendower siding is the same as that described in last year's Report, except that the road from the mine to the lake shore has been straightened and shortened, making it possible for the teams to make another trip per day.

No. 2 pit on the southwest side of the quarry has a depth of about 75 feet and an area of 250 feet by 50 feet. No. 2 pit on the northeast side has an area of 300 feet by 50 feet and an average depth of 50 feet, but there is a difference in elevation of 65 feet from the top of the stope to the sump. A shaft 30 feet deep has been sunk between No. 1 and No. 2 pit, and the water drains from the whole pit to the shaft, where a No. 10 Cameron pump raises it to the surface. The feldspar in No. 2 pit is dipping to the northwest under the body of quartz which appears on the surface.



Kingston Mining and Developing Co's feldspar mine.

A new rock house has been built on the hill near the boiler house where No. 1 derrick was situated. This is 53 feet high to the sheave, and hoisting is done by means of bucket attached to the car on a 2-inch cable passing over the top of the head frame and solidly fastened at each end. The car with the bucket attached runs down the cable way to the pit, where the bucket is lowered to the desired position. Hoisting from the northeast end of No. 2 pit is by derrick. Sizing screens and sorting floors are placed in the rock house. The impure ore is sorted out on the floor of the rock house, and the good ore is run into pockets from which it is emptied into the buckets on the wagons. A force of 48 men is employed under superintendent Mr. M. J. Flynn.

The Jenkins mine a short distance from the Richardson on the south half of lot 2 in the third concession of Bedford was closed down last year and has not as yet been re-opened.

Border Mine

This mine is situated on the west half of lot 5 in the twelfth concession of the township of Portland, and two miles northeast of Verona. The mine has been closed for about two years, but work was again begun about the middle of May, 1906. The feldspar is being taken out of an open cut some 200 feet long, 20 feet wide and 25 to 30 feet deep. The dike of feldspar here runs in a northeast by southwest direction, and cuts across the gneiss formation. Bodies of quartz are found in the dike where it has crystallized out from the magma. The feldspar is hauled from the mine by waggon to the nearest station, Verona, for shipment. Mr. W. H. Oliphant is superintendent, employing a force of 10 to 15 men. The property is owned by the Pennsylvania Feldspar Company.

Kingston Mining and Development Company

This company began work in September 1905, on lot 16 in the eleventh concession of the township of Portland about two miles west of Verona. The workings consist of an open cut 200 feet long by 25 feet wide and 8 feet deep. The feldspar occurs in a large pegmatite dike, and is the predominant mineral in that part of the dike being worked. A few hundred feet south on the dike large bunches of quartz are seen to outcrop. The dike occurs cutting a dark gneiss. A small boiler furnishes steam for use in drilling. The feldspar is hauled by teams to Verona where it is shipped to East Liverpool, Ohio.

The president of the company is Mr. W. Collier, and the foreman, Mr. H. Leeman, employing a force of 18 men.

MICA

During 1905 there were very few mica mines in operation in the Province, but the increase in the price has revived the industry to such an extent that three or four new properties have commenced operations. Another factor is the increased demand, and consequently the increase of price for small sizes. The cause of the increased consumption of mica is the activity in the manufacture of electrical machinery. All the large electrical companies have their factories running to their fullest capacity, thus creating a very large demand for mica, which is necessary for insulating purposes.

In addition to the mining of mica the work of preparing it for use in the manufacture of micanite has created quite an industry. The mica factories are nearly all situated in Ottawa, where the supply of mica can be drawn both from the mines of Quebec, which are nearly all in that section, north of Ottawa between the Gatineau and Lièvre rivers, and the mines of Ontario. In the preparation of mica for the market the most expensive part of the work is splitting the mica into exceedingly thin sheets to be built up into micanite. This labor has to be performed entirely by hand, girls being chiefly employed. In Ottawa alone over 800 girls are engaged in splitting and trimming mica.

General Electric Company

Except for employing a few prospecting parties, this company's operations in 1905 were confined to working the Lacey mine in Loughboro township some four miles north of Sydenham. This mine last year furnished over half of the total production of the Province. The main shaft (depth 185 feet) has not been sunk any deeper since last inspection, the greater part of the work being done on the first, fifth and sixth levels and on the side cut from the second level. On the first level (depth 60 feet) 20 feet in, on the cross-cut from the southeast drift at 100 feet from the shaft, a drift has been run back towards the shaft parallel with the main drift a distance of 25 feet. This drift runs to the end of the new stull on this level.

On the second level (depth 85 feet) the cross-cut into the hanging wall has been driven 55 feet to cut a parallel vein located by means of the diamond drill. On this vein a drift has been run southeast 95 feet, the drift averaging 17 feet in width owing to the width of the vein at this place. A winze has been sunk from the end of the drift 30 feet and drifts run from the bottom of the winze southeast 15 feet and northwest 30 feet.

On the fifth level (depth 140 feet) a winze has been sunk to the sixth level, a distance of 30 feet, and the main vein stoped out for a distance of 50 feet. The side cut from this vein has been stoped out from the fourth to the sixth level for a length of 100 feet. This side cut is what was termed the westerly drift on this level.

The sixth level has been stoped out and the work of stripping the walls begun.

A shaft is being sunk some 300 feet southeast of the main shaft and a depth of 60 feet has been reached. No changes have been made in the surface plant.

Mr. G. W. McNaughton is manager of the General Electric Company's mines.

The prospecting parties mentioned above operated in 1905 on properties owned by the company, near Carp, Carleton county, on the Burns property near Perth, near Maberly, and in the vicinity of Gould lake, Loughborough township.

Richardson Bros., Mines

The Richardson Bros. worked two mica properties during part of 1905, the Freeman mine on lot 7 in the ninth concession of Loughboro township, and the Baby mine on lot 11 in the fifth concession of North Burgess. In the former a vein of amber and milky mica was worked and also a vein of black mica. In the latter considerable work was done in fitting up the mine, which had been worked some years ago, but no great quantity of mica was raised.

Grant Property

This property adjoins the McClatchey mine on lot 8 in the tenth concession of Loughboro, and has been recently purchased by Mr. J. W. Trousdale of Sydenham. A small force of about 6 men is employed under foreman Mr. D. Boyce. A pit about 50 feet long, 25 feet deep and 5 to 6 feet wide has been sunk. The mica occurs in crystals in pink calcite and pyroxene, having a strike northwest by southeast.

On the north part of the above mentioned lot a few men are employed prospecting under foreman Mr. A. Whaley. The owners of the lot are Messrs. Solliday and Grandon. One pit has been sunk to a depth of 25 feet in addition to smaller surface prospects.

Bear Lake Mine

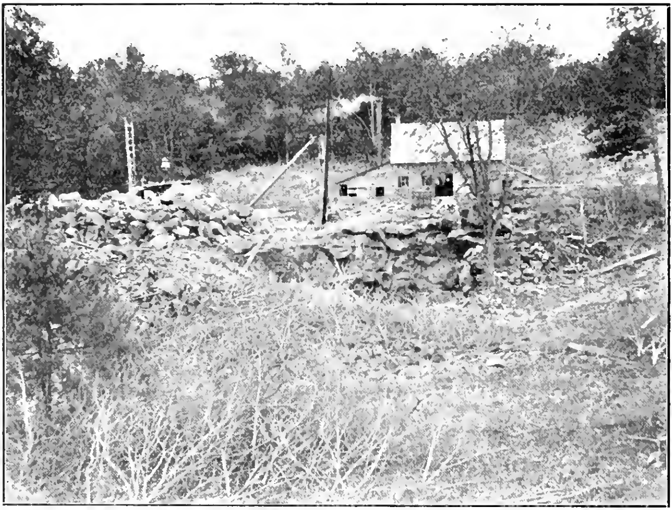
This mine was unwatered at the time of my inspection in May 1906, but no work had been done in the main workings for the last three years. The mine is on lot 10 in the eleventh concession of Loughboro township, and is owned by Mr. J. H. Roberts of Perth Road. The main pit is about 100 feet deep from the mouth of the mine to the heading on an incline of about 42 degrees. The mica in the main pit appears to occur in pockets in the pyroxene and calcite, and the pit has been opened up simply by following from one pocket to another. The vein matter of pyroxene and calcite has a strike of south 15 degrees west. A number of other leads have been opened up on other parts of the property, having practically the same strike as the main vein. Instructions were given to have hoisting gear put in better condition.

Kent Bros.

Messrs. Kent and Stoness are engaged in prospecting properties on Devil lake and Bob's lake. Only a small gang of men are employed at each place and surface prospecting only is being done. The property being worked on Devil's lake is what was formerly known as the Antoine property.

Brockville Mining Company, Limited

The property operated by the above company is situated on lot 7 in the sixth concession of Bastard township, county of Leeds. Work was done here some years ago, but owing to the mica being very dark, operations were discontinued. The mine was opened again this year under the management of Mr. A. C. Hardy, with foreman Mr. Arthur Last employing about 10 men. A pit has been sunk 60 feet deep, and 60



Brockville Mining Co's mica mine, near Elgin.

feet across each way in section. The vein is about 4 feet wide and dips at 30 degrees to the horizontal. There is very little vein filling, as the mica occurs throughout. In some places in the vein there is considerable iron pyrites The vein is enclosed in a very dark hornblende granite.

The mica is shipped to Brockville, where it is prepared for the market, a force of 10 cleaners being employed.

Martha Mine

This property situated on the northeast half of lot 13 in the sixth concession of the township of North Burgess, owned by the Mica Manufacturing Company, has been leased by Messrs. Sewell and Smith of Perth, and has been operated by them since August 14th, 1905. At the time of my inspection there was no mining work being done. The north pit known as No. 3 pit, which was worked all winter, had been closed and allowed to fill with water. This pit is 90 feet in depth and about 100 feet in length. Preparation was being made to open up No. 2 pit, which is just south of No. 3, having practically the same strike. The mica occurs chiefly in a vein filling of calcite containing some apatite. The south end of No. 2 pit is separated from No. 1 pit by a dike diagonally cutting across the vein. This dike faults the vein, causing a short throw to the west. In order to work on No. 2 pit a great deal of the old dump had to be removed, as it had been placed too near the pit for safety.

The machinery consists of an 80-h.p. return tubular boiler, steam hoist, drills and pumps. The mica is cleaned at the mine.

Mr. T. Smith is looking after the mining work, employing a force of 12 men.

Mr. Edward Smith of Prescott has been carrying on mining operations on lot 9 in the seventh concession, and on the east half of lot 13 in the fifth concession of North Burgess during the last year. On the former lot work is being done in two pits which had previously been worked. One pit is 35 feet deep and the other 50 feet, on parallel veins about 100 feet apart. Hoisting from each pit is being done by horse whim. Instructions were given to have the loose ground near the surface timbered. John McGlade is foreman, employing a force of 8 men. The mica taken out is cleaned on the property.

On lot 13 in the fifth concession a pit, which was described in a former Report as having been purchased and developed by the Dominion Improvement and Development Company with head offices at Hamburg, is being worked for mica. The option expired, and the property reverted to the original owner. A good showing of mica in the pit originally worked for apatite, has been struck. The mica is a very good quality, and occurs in a vein filling of calcite and apatite. The pit is 45 feet deep and 50 feet from heading to heading, having an average width of 10 feet. About 4 tons of apatite is hoisted per day in addition to the mica. The apatite is quite fine and granular, and of a greenish tinge.

Mica Trimming Works

The General Electric Company's factory on the corner of Isabella and Elgin streets, Ottawa, employs a force of 150, the greater number being girls, in cleaning, cutting and thin-splitting the mica, which is brought at present from the company's mine at Sydenham. The mica is shipped from the mine to the factory after being rough cobbed. At the factory the mica is cleaned, knife trimmed, graded and thin-split, after which it is packed and shipped to the company's factory at Schenectady, N. Y. The superintendent of the factory is Mr. R. E. Vivison. In addition to the factory in Ottawa the General Electric Company have opened up factories in Carleton Place, where 72 girls are employed, at Smith's Falls, where 60 girls are employed, and at Buckingham, Quebec, where 60 are employed. The mica for all these factories is brought from the Company's mine in Ontario.

The Laurentide Mica Company's factory on the corner of Queen and Bridge streets, Ottawa, employs a force of 450, of whom 400 girls are employed thin-splitting and the rest in cleaning, knife trimming and grading. Most of the mica used in this factory is mined in Quebec. The superintendent of the factory is Chas. Girteau

Kent Bros. of Kingston opened up mica works at 429 Sussex street, Ottawa, on 7th of March, 1906. Mica for the factory is brought from the company's mines in Ontario and Quebec. The superintendent is F S. Shirley, who employs a force of 50, most of whom are girls.

Kent Bros. have also a factory at the foot of Princess street, Kingston, where about 25 girls are employed. The mica used here is brought from their mines near Devil and Bob's lakes, Frontenac.

Eugene Munsell and Company have moved their factory to 400 Wellington street Ottawa, and employ on an average 70 girls under superintendent F. Fillion. Mica is bought by the company in both Ontario and Quebec, and shipped to the factory to be prepared for the trade.

Norman B. Holland has opened mica works at 427 Sussex street, Ottawa, and employs a force of about 50, the greater number being girls. The mica used is bought both in Ontario and Quebec.

The Wallingford Mining and Mica Company have mica works on Sussex street, Ottawa The mica used is brought from the Wallingford mine to Quebec. About 10 girls are employed.

R. Blackburn's factory on Sussex street, Ottawa, employs about 80 girls, of whom 35 are employed thin-splitting, 40 cleaning and 5 knife trimming. The mica used is brought from the Blackburn mine, Perkins Mills, Quebec. Mr. A. Goulais is foreman of the factory.

Webster and Company have a force of 20 girls employed thin-splitting mica purchased both in Ontario and Quebec.

The Comet Mica Company, located on Wellington street, Ottawa, have a force of 25 girls employed.

In Perth the Adams trimming works have been in operation the most of the year. a few hands being employed.

At Sydenham, Mr. J. W. Trousdale has had a small force employed at different times cleaning the mica brought from his own mines.

Graphite

The Black Donald Graphite mine near Calabogie was in operation the greater part of last year. The new shaft on an incline of 30 degrees was continued until the water began to come in very heavily, and when work in it was stopped and the old pit pumped out. This was followed by a cave in, without, however, disastrous effect. A new vertical shaft was then begun and a small gang are at work on it.

The McConnell graphite mine in North Elmsley township about seven miles from Perth was not operated during 1905, but it was stated by the manager at the time of inspection in May 1906, that it was to re-open very shortly. The mill two miles from the mine at Port Elmsley has been overhauled and new machinery installed and put in condition for operation. The graphite bearing rock is hauled by wagon from the mine to the mill. A full description of the mine and mill is given in the twelfth Report of the Bureau of Mines.

Talc

The Henderson talc mine on lot 14 in the fourteenth concession of the township of Huntingdon, about one mile east of Madoc, was operated for about two months during 1905 by Mr. S. Wellington of Madoc. Several hundred tons of talc was taken out and shipped Timber was put in near the surface as instructed. In taking out the talc the pit was carried the full width of the deposit about 20 feet wide and 40 feet in length. Arrangements are being made to secure the Canadian trade and to put up a grinding plant at the mine

Fluorspar

Mr. S. Wellington of Madoc has opened up a deposit of fluorspar on lot one in the fourth concession of Madoc township, about 1 mile west of the town of Madoc. A car load of very high grade fluorspar has been taken out. The pure fluorspar occurs as a vein from one to two feet wide and disseminated through calcite and barite for another two to three feet. The strike of the vein is east and west, and it has been traced by shallow pits for about 40 feet. One pit has been sunk 20 feet on the vein.

Sodalite

About two miles southeast of Bancroft a sodalite deposit was opened up last winter by Mr. T. Morrison, representing a Scotch company. The sodalite occurs here massive in nepheline syenite directly as a product of the crystallization of a magma rich in soda. Sodalite is chemically a complex silicate of sodium and aluminium, and is used chiefly as a decorative stone, having the property of taking a very high polish.

Two open pits have been opened up by this company and some very large blocks taken out. One open cut is about 100 feet long by 25 feet wide.

On places near the contact of the sodalite with the nepheline syenite, are found some very fine crystals of aventurine oligoclase or sunstone, also crystals of apatite, mica and magnetite.

A building has been erected in which to cut and polish the material, but no machinery for this purpose has as yet been put in.

Marble

About 1½ miles southwest of Bancroft on a farm owned by Wm. Gaebel, a deposit of marble is being opened up by the Central Ontario Granite and Marble Company of Trenton, of which Mr. C. E. Ritchie of Akron, Ohio, is one of the directors. Mr. T. Morrison of Bancroft is superintendent, and has a force of about 25 men engaged in stripping and otherwise opening up the deposit. The marble is mostly a white crystalline limestone, but at one end of the ridge, it has a light grayish color, and is also a little finer in texture. The ridge on which the marble outcrops has a strike northwest by southeast and has been tested by pits and trenches for about three-eighths of a mile. It has an elevation of about 60 feet above the average surface level in that vicinity, giving good quarrying ground. A spur line about one and a half miles long is being put in to the quarry from about half a mile below Bancroft on the Central Ontario railway.

Granite

About one mile southeast of Bancroft a little work has been done to develop a deposit of granite which occurs here. The rock is essentially a granite gneiss carrying a little hornblende as a constituent. It is fine grained, compact, has a high tensile strength, and takes a good polish. Mr. James Best of Bancroft is interested in this granite property.

Calcium Carbide

The calcium carbide factories at Ottawa and Merriton were run continuously all of last year. There is an increased demand for the product, particularly from the small towns which have neither electric light or gas. The installation of an acetylene lighting system is not very expensive, and the light is useful in hotels, large stores, etc. The twenty furnaces of the Ottawa Carbide Company at Ottawa are all kept in operation when there is sufficient electric energy supplied. During low water on the Ottawa river the amount of electricity generated is not sufficient to run all the furnaces.

NATURAL GAS AND PETROLEUM

BY EUGENE COSTE, E.M.

The production of both natural gas and petroleum in Ontario show a marked increase in 1905 of about 24 per cent. each over the previous year. Some of the recent fields or pools found in 1903 and 1904 were considerably enlarged and became much more productive.

In the case of oil, the Leamington field of Essex county and the Moore field of Lambton county account for most of the increase; the Leamington field recording in 1905 a production of 113,806 barrels, or an increase of 351 per cent. over 1904, and the Moore field also showing the very substantial increase of 153 per cent., with a total production for the year of 93,815 barrels. Among the old pools the only one with a noticeably increased production was the Dutton pool, which produced 20,976 barrels in 1905, or 47 per cent. more than in 1904. The production of the Oil Springs and Bothwell old pools remained about stationary, with records for 1905 of 78,125 barrels, and of 47,959 barrels respectively; while the Petrolia field production declined 10 per cent., with a total of 250,701 barrels in 1905.

The increase in the natural gas production is due to the opening of new pools in the townships of Crowland, Humberstone (the N. W. part) and Wainfleet in Welland county, and also in the townships of Rainham and Walpole, near the village of Selkirk, in the county of Haldimand. From these new gas fields the cities and towns of Niagara Falls, Ont., St. Catharines, Hamilton, Brantford and Galt, are now enjoying the advantages of natural gas for fuel and light. Recent drilling is proving successful in enlarging the productive area of these fields, and further drilling will most likely yet uncover several productive pools at present unknown. The outlook for a continuation of a moderate supply to these towns can therefore be regarded as good, especially when it is considered that the old original field in Humberstone and Bertie townships, Welland county, is still supplying considerable quantities of gas after a continual heavy pull on the wells for more than 15 years.

In Essex county the town of Leamington is again getting a supply of natural gas, from wells a couple of miles southeast of the town. This gas territory constitutes the south end of the Leamington oil field, which runs from there, over a sharp and narrow fissured fold or break in the underlying strata, for a distance of 20 miles, right across the whole county of Essex in a north and south direction. The small production of oil on the Stony Point road near Comber is on this break, which reminds one of the Findlay break so well described by Orton in the Geological Reports of Ohio.

The other villages and towns of Essex county previously supplied with natural gas from the old Kingsville-Leamington field have now lost the advantages of this remarkably convenient and clean fuel, and the three main lines which had been laid from the field to Windsor have been picked up and sold. In this connection, the remark may be permitted that if the big market of Detroit city had not been cut off some years ago by the action of the late Government of Ontario in withdrawing the license to pipe across the Detroit river, there would have been a much stronger incentive for drilling operations in the county of Essex, which it is quite reasonable to suppose would have brought about the discovery of new gas fields there, and probably also of new oil fields. Even the old field itself would have lasted longer, as it would have been better taken care of. As it was, a short time after the revocation of the license, this old field was allowed to drown out completely when the rock pressure of the field was still 300 pounds to the

square inch. To save the field from drowning at that time was quite feasible, but it was expensive, and in view of the limited market then available under the new conditions created by the action of the Government, it was, evidently, considered too expensive. The net and final result was a great loss to the people of the county.

Geology of Oil and Gas Fields

The geology of the Ontario oil and gas fields was the subject of a complete review by Mr. E. T. Corkill in the report of this Bureau of last year, in which mention was also made of the previous work, references and published information on the subject. It is therefore not necessary to add very much to it this year, but as a further contribution there is presented below the logs of a few deep wells not heretofore published, and the records of two or three wells already published but somewhat differently interpreted here:—

Well No. 1.

Well No. 2 of the Grey and Bruce Oil and Gas Co., Limited, at Hepworth, on Lot 1 in the 10th Concession of Amabel Township, Bruce County, Ontario. Elevation about 950 feet A. T.

Formation.	Thickness.	Depth	Remarks
Soil	4 feet to	4 feet.	
Niagara limestone, Niagara shales, and Clinton limestone	191 feet to	195 feet.	
Medina, Hudson River and Utica shales	750 feet to	945 feet.	A little salt water at 760 feet.
Trenton limestone	625 feet to	1,570 feet.	Gas struck at 1,405 feet.
Calciferous sandstone	30 feet to	1,600 feet.	
Archean granite	1,600 feet to	1,650 feet.	

Well No. 2.

Well in the southeast corner of Lot 10, in the 11th Concession of Osprey Township, County of Grey, Ontario. Started 24th September, finished 22nd October, 1900. Elevation of derrick floor 1,550 above tide.

Formation.	Thickness.	Depth.	Remarks
Soil and clay	6 feet to	6 feet.	
Gravel	6 feet to	12 feet	
Limestone with mud seams, Guelph and Niagara: from 130 to 170 white crystalline porous limestone: from 170 to 195 gray limestone with spathic iron and a little shale	183 feet to	195 feet.	10-inch drive pipe down to 25 feet $8\frac{1}{4}$-inch casing down to 50 feet.
Gray-blue shales, Niagara	32 feet to	227 feet.	
Dark gray, hard limestone, Clinton	48 feet to	275 feet	Water struck in the Clinton.
Red shales, Medina	255 feet to	530 feet.	Fresh water cased at 285 with $6\frac{1}{4}$ casing, salt water at 295 and at 315, re-cased with $6\frac{1}{4}$ casing at 375.
Blue shales and lime shells, Hudson River	530 feet to	1,060 feet.	
Black shales, Utica	100 feet to	1,160 feet.	Quite soft.
Limestone and shales intermixed in small layers, Trenton	30 feet to	1,190 feet.	
Solid compact dark gray limestone, mostly shaly Trenton	563 feet to	1,753 feet.	A strong smell of oil at different depths in the Trenton, especially at 1,650. At 1,361 struck gas in white crystalline layers of the limestone; burned in the $6\frac{1}{4}$ casing 3 to 4 feet high: about 25,000 feet a day.
White Calcareous sandstone (Calciferous 47 ft.)	12 feet to	1,765 feet.	A small quantity of green amber oil struck between 1,760 ft. and 1,765 ft
Purple micaceous iron shales (Calciferous 47 ft.)	10 feet to	1,775 feet.	
Grey granite Arkose or coarse sandstone (Calciferous 47 ft.)	10 feet to	1,785 feet.	
Red granite Arkose or coarse sandstone (Calciferous 47 ft.)	15 feet to	1,800 feet.	
Granite	1 foot to	1,801 feet.	

Well No. 3.

Well near Alma, on the J. Stickney farm, Lot 6, Concession 5, Pilkington Township, Wellington County, Ontario. Elevation by barometer about 1,375 feet.

Formation	Thickness.	Depth.	Remarks.
Drift	103 feet to	103 feet.	
Dolomite and limestone, Onondaga	252 feet to ...	355 feet.	
Light colored and yellow limestone and dolomite, Guelph and Niagara	215 feet to	570 feet.	
Shales, red 1st five feet, Niagara	30 feet to	600 feet.	
Hard limestone, Clinton	42 feet to ...	642 feet.	
Red shale, Medina	393 feet to ...	1,035 feet.	
Light blue shale, Hudson River	565 feet to ...	1,600 feet.	
Black shales, Utica	85 feet to	1,685 feet.	
Limestone, Trenton	695 feet to	2,380 feet.	At 2,335 struck gas enough for 2 stoves.
Arkose sandstone, Calciferous	5 feet to	2,385 feet.	

Well No. 4.

Well near Glen Allan, drilled by the Ohio Oil Co., on the Ernst farm, Lot 5, Concession 3, Township of Peel, County of Wellington, Ontario. Completed July, 1900. Elevation by barometer about 1,245 feet.

Formation	Thickness	Depth.	Remarks.
Gravel with pieces of limestone	35 feet to	35 feet	
Dolomite and limestone, Onondaga	517 feet to	552 feet.	Big flow of sulphur water struck at 140. Another flow of sulphur water at 275; 40 to 50 bbl. per hour. Cased at 370 feet with $8\frac{1}{4}$ casing.
Dolomite and limestone, Guelph and Niagara	220 feet to	772 feet.	
Shales, Niagara	30 feet to	802 feet.	
Limestone, Clinton	29 feet to ...	831 feet.	
Red shales, Medina	367 feet to	1,198 feet.	Cased at 985 feet with $6\frac{1}{4}$ casing.
Drab and blue shales, Hudson River	572 feet to	1,770 feet	
Dark shales, Utica	47 feet to	1,817 feet	
Limestone, Trenton	705 feet to	2,522 feet	Oil smell at 2,430, gas for 2 stoves struck at 2,506 feet.
Pink sandstone, very hard, Calciferous	51 feet to ...	2,573 feet	Tools stuck and hole abandoned at 2,573 feet, probably in granite.

Well No. 5.

Well drilled at Stratford, Ont., in 1895, Contractor J. H. Mook. Elevation about 1,180 feet above tide.

Formation.	Thickness.	Depth.	Remarks.
Drift	143 feet to...	143 feet.	
Limestones and Dolomites, Onondaga, Guelph-Niagara, Clinton	1,159 feet to ..	1,302 feet.	
Red, blue and black shales, Medina, Hudson River, Utica	1,044 feet to...	2,346 feet.	Strong smell of oil in the Utica shales above the Trenton.
Limestones, Trenton	40 feet to ..	2,386 feet.	Salt water in quantity at 2,385

Well No. 6.

Well near Inwood, drilled by the Ohio Oil Co., on Lot 5, Concession 4, Brooke Township, Lambton County, Ont., completed March 3, 1900. Elevation by barometer about 690 feet.

Formation.		Thickness.	Depth.	Remarks.
Clay		60 feet to	60 feet.	
Gravel		5 feet to	65 feet.	
Shales	Hamilton	85 feet to	150 feet.	
Upper lime	Hamilton	15 feet to	165 feet.	
Upper soap	Hamilton	205 feet to	370 feet.	
Middle lime, dark brown	Hamilton	25 feet to	395 feet.	
Lower soap	Hamilton	25 feet to	420 feet.	
Limestone, Corniferous		115 feet to	535 feet.	Black sulphur water at 500 feet, or in the Petrolia and Oil Springs oil rock
Dolomites, limestones and marls with gypsum and salt, Onondaga		1,300 feet to	1,835 feet.	Rock salt from 1,410 to 1,655 feet, or 245 feet of it in a solid bed, with only 3 small layers of limestone. Another rock salt bed at bottom from 1,810 to 1,835 feet
Limestones and dolomites, Guelph and Niagara		225 feet to	2,060 feet.	
Dark shales, Niagara		15 feet to	2,075 feet.	
Limestone, Clinton		35 feet to	2,110 feet.	
Red shales, Medina		440 feet to	2,550 feet.	
Light gray shales with limestone shells, Hudson River		275 feet to	2,825 feet.	
Dark shales, Utica		175 feet to	3,000 feet.	
Limestone, Trenton		380 feet to	3,380 feet.	No oil, gas or salt water

Well No. 7.

Well on the Bradley Estate, Petrolia, Lot 11, Concession 11, Township of Enniskillen, County of Lambton, Ontario, completed in 1900, drilled by F. J. Carman. Elevation 667 feet A. T.

Formation.			Thickness.	Depth.	Remarks.
Clay drift			98 feet to	98 feet.	
Upper lime	Hamilton 240 feet.	40 feet	240 feet to	338 feet.	
Upper soap		127 feet			
Middle Lime		18 feet			
Lower soap		45 feet			
Limestone, Corniferous			187 feet to	525 feet.	
Sandstone, Oriskany			50 feet to	575 feet	
Limestone and dolomite, gray and brown, Onondaga	Total thickness Onondaga 1545 feet		630 feet to	1,205 feet.	Heavy water vein in a brown soft limestone at 970 feet, cased with $6\frac{1}{4}$ casing in a dark hard dolomite at 1,015 feet, and dry hole after that
Rock salt intermixed with a little dolomite, Onondaga			680 feet to	1,885 feet.	Not more than about 75 feet of dolomite.
Brown and sandy dolomite, Onondaga.			145 feet to	2,030 feet	
Rock salt, Onondaga.			90 feet to	2,120 feet.	
Limestone, Guelph and Niagara			225 feet to	2,345 feet	
Shales and limestone, Niagara and Clinton			50 feet to	2,395 feet.	
Red shales, Medina			440 feet to	2,835 feet	
Blue and black shales, Hudson River and Utica			375 feet to	3,210 feet.	
Limestone, gray and dark, Trenton			567 feet to	3,777 feet	

Well No. 8.

Well near Woodslee, on the Mitchell farm, Lot 28, Concession 2, Rochester Township, Essex County, Ontario, completed December 5, 1903. Elevation by barometer 620 feet above tide.

Formation.	Thickness.	Depth.	Remarks.
Boulder clay	144 feet to	144 feet	2 or 3 feet gravel underlaid with 10 feet soft clay at bottom
Limestone, Corniferous	84 feet to	228 feet.	
Sandstone, Oriskany	40 feet to	268 feet	
Dolomite and limestone with gypsum, Onondaga	1,037 feet to	1,305 feet	Cased at 840 feet with $6\frac{1}{4}$ casing; gypsum bed from 1,260 to 1,270 feet
Blue white crystalline dolomite, Guelph	25 feet to	1,330 feet.	Salt water at 1,325 feet.

Well No. 9.

Well drilled by the Leamington Oil Co. in 1905 on east Lot 239, North Talbot Road, Mersea Township, Essex County, Ontario. Elevation 630 feet, A. T.

Formation.	Thickness.	Depth.	Remarks.
Drift	89 feet to ..	89 feet.	10-inch drive pipe down to 89 feet.
Limestone and dolomites with gypsum, Onondaga	1,006 feet to ..	1,095 feet	8-inch casing down to 585 feet.
Limestone and dolomites, Guelph, Niagara and Clinton	375 feet to ..	1,470 feet.	Large quantities of salt water.
Red shales, Medina	410 feet to ..	1,880 feet.	Cased with $6\frac{1}{4}$ casing at 1,556 feet. Some limestone at 1,650 feet.
Blue and black shales, Hudson River and Utica	608 feet to ..	2,488 feet.	
Limestones, gray and dark, Trenton	408 feet to ..	2,896 feet.	

Well No. 10.

Well drilled in 1888, at Brantford, Ontario. Contractor, W. H. Curtis. Elevation about 730 feet above tide.

Formation.	Thickness.	Depth.	Remarks.
Drift	45 feet to ..	45 feet.	
Limestones, dolomites and shales, Onondaga, Guelph and Niagara, Clinton	370 feet to ..	415 feet.	
Red sandstone, red and blue shales and white sandstone, Medina	100 feet to ..	515 feet.	
Red, blue and black shales, Medina, Hudson River, Utica	1,435 feet to ..	1,950 feet.	
Limestone, Trenton	210 feet to ..	2,160 feet.	A little gas struck on top of Trenton.

Well No. 11.

Well drilled in 1893, off Clyde Avenue West, in Hamilton, Ontario. Elevation about 290 feet above tide.

Formation.	Thickness.	Depth.	Remarks.
Red, blue and black shales, Medina, Hudson River, Utica	1,250 feet to ..	1,250 feet.	
Limestone, Trenton, at	1,250 feet		Gas at 1,860 feet towards bottom of Trenton measuring 7,000 ft. a day.
Bottom of well in Archean at	1,960 feet.		

Well No. 12.

Well near St. Catharines, Ontario, on Lot 4, Concession 3, Township of Louth, Lincoln County, Ontario, drilled in 1888. Elevation about 300 feet A. T.

Formation.	Thickness.	Depth.	Remarks.
Clay and gravel, drift	90 feet to	90 feet.	At 57 feet a great deal of pure water in bed of gravel 7 or 8 feet thick.
Red shales, Medina	548 feet to	638 feet.	Salt water at 220, small pocket of gas at 275; cased at 272, hole quite dry after.
Blue shales, Hudson River	700 feet to	1,338 feet.	
Black shales, Utica	168 feet to	1,506 feet.	
Gray and dark limestone, Trenton	667 feet to	2,173 feet.	
Very white sharp sandstone	27 feet to	2,200 feet.	Gas struck at 2,185 feet in small quantity.

Well No. 13.

Well drilled at Thorold, Welland County, Ontario, in 1889. Elevation about 500 feet above tide.

Formation.	Thickness.	Depth.	Remarks.
Drift	43 feet to	43 feet	
Limestone and shales, Niagara	52 feet to	95 feet	
Limestone, Clinton	30 feet to	125 feet.	
Red sandstone and shales, Medina	82 feet to	207 feet.	
Grey sandstone, Medina	30 feet to	237 feet.	
Red shales, Medina	658 feet to	895 feet.	
Dark blue and black shales, Hudson River and Utica	905 feet to	1,800 feet.	
Light and dark limestone, Trenton	683 feet to	2,483 feet	A little gas at 2,400 feet. A little salt water at 2,450 feet.

Well No. 14.

Well No. 143, Provincial Natural Gas and Fuel Co. of Ontario, Limited, Lot 4, Concession 3, Willoughby Township, Welland County, Ontario. Elevation 590 feet A. T.

Formation	Thickness.	Depth.	Remarks.
Clay and gravel, drift	61 feet to	61 feet	
Dolomites, Onondaga	135 feet to	196 feet	
Dolomites, Guelph and Niagara	227 feet to	423 feet.	
Dark shales, Niagara	50 feet to	473 feet	
White limestone, Clinton	30 feet to	503 feet.	
Red sandstone and shales, Medina	91 feet to	594 feet	
White sandstone, Medina	20 feet to	614 feet.	
Red shales, Medina	915 feet to	1,529 feet.	
Blue and black shales at bottom, Hudson River and Utica	784 feet to	2,313 feet.	
Limestone, Trenton	685 feet to	2,998 feet.	
Sandstone, Calciferous	32 feet to	3,030 feet.	Gas at 2,998 feet and 3,003 feet measuring 60,000 feet per day; salt water at 3,030.
Archean granite	2 feet to	3,032 feet.	

Logs

The above records show conclusively that from Osprey township, Grey county, to Petrolia, Lambton county, the strata dip more or less uniformly in a southwesterly direction; the top of the Trenton, for instance, being as follows:—

In Osprey township	350 feet above tide.
Near Alma	310 feet below tide.
At Glen Allan	572 feet below tide.
At Stratford	1,166 feet below tide.
Near Inwood	2,310 feet below tide.
At Petrolia	2,543 feet below tide.

Continuing in the same direction further to the southwest the strata rise, on the contrary, more or less gradually; the top of the Trenton having been found at 1,860 feet below tide near Leamington, and at 1,500 feet below tide in the southern part of Colchester township, Essex county, at the Woodbridge well.[1] It is well known also that still continuing in the same southwest direction the top of the Trenton just across lake Erie in northwestern Ohio is about 800 feet below tide, and at Findlay, Hancock county, Ohio, only about 350 below tide. It is therefore quite plainly demonstrated that the Lambton county oil fields are really in the bottom of a broad deep syncline instead of being on the Cincinnati anticline as often supposed and contended. Orton, in his Geological Reports on Ohio, has long ago proved that the Cincinnati anticline runs northwest into Indiana, and not northeast, although he also shows that a minor fold runs through the northwest part of Ohio in a northeast direction, but this fold, which is still noticeable in the south part of Essex county, Ontario, seems to die out in the northeast part of it and in Kent county before reaching Lambton county.

[1] See the writer's paper on "Natural Gas in Ontario," Journal of the Canadian Mining Institute, Vol. 3, for the log of this well.

The records of the wells in the Niagara Peninsula above given, (as well as the records of other wells drilled there and already published) show that the strata in that peninsula have a more or less constant dip to the south-southeast.

As the gas fields of Welland and Haldimand counties are on the flank of that long slope which continues to the south across lake Erie into New York and Pennsylvania, and also to the north across lake Ontario, it is to be seen that the famous anticlinal theory of oil and gas production is far from being supported by the facts either in the gas fields of the Niagara peninsula or in the oil fields of Lambton county. Disturbances and faults do exist in these oil and gas fields, sometimes bringing up the strata locally, in blocks, terraces or sharp folds, but the more or less broad anticlines which those who support the theory of the organic origin of oil and gas regard as so necessary to the large accumulations of these products, are conspicuously absent.

Another result of the drilling recorded in the above logs which may be pointed out is that both oil and gas have been found in Ontario in the lower part of the Trenton and right on the top of the Archean. This of course cannot be explained by any other view of the origin of oil and gas than the view of volcanic emanations from below of the French School of geology, which the writer has advocated for several years past,[2] and to which he is not aware that any serious answer has yet been made. This is referred to only to point out the practical side of it: it is most important, in considering and planning future oil and gas developments in Ontario, to know that oil and gas are due in large quantities just as well under the Petrolia oil rock, viz., the Corniferous limestone, as in or above it, and therefore that if we search and drill along the fissured oil belts or zones which traverse Ontario in exactly the same manner as they traverse Pennsylvania, Ohio and Indiana, we will develop in Ontario similar extensive oil and gas fields as have been found in the above named States. The Leamington oil field, the oil of which comes from the Guelph limestone, a stratum about 1,150 feet below the Corniferous, and the large gas fields of Welland and Haldimand which derive their supplies of gas from still lower strata, viz., the Clinton, Medina and Trenton, amply and fully demonstrate the above remarks.

Tabulated, the principal features of the above logs or records of deep wells are as follows: —

Formation.	Hepworth.	Osprey Township.	Alma.	Glen Allan.	Stratford.	Inwood.	Petrolia.	Woodslee.	Leamington.	Woodbridge Well, Essex County.	Brantford.	Hamilton.	St. Catharines	Thorold.	Willoughby Township.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		(10)	(11)	(12)	(13)	(14)
Onondaga, dolomites and marls, thickness.......	none	none	+252	517		1300	1595	1037	+1006	+800	+80	none	none	none	+135
Guelph, Niagara and Clinton, dolomites and limestones, thickness	+191	263	287	279	1159	275	275	......	375	370	290	none	none	82	307
Medina, Hudson River and Utica, shales, thickness	750	880	1043	986	1044	890	815	......	1018	870	1535	1250	1416	1675	1810
Trenton, thickness.......	625	593	695	705	40	380	567	......	408	270	210	......	667	683	685
Depth of Trenton above (+) or below (—) tide....	+5	—390	—310	—572	—1166	—2310	—2543	......	—1858	—1500	—1220	—960	—1206	—1300	—1723

The sign + stands for "more than".

[2] See Vol. VI., Journal of the Canadian Mining Institute, pages 73 to 128.

The above table shows that in the western part of the Ontario peninsula the thicknesses of the various lower formations are as follows:

Dolomites and marls of the Onondaga	1,000 feet to 1,600 feet, with some thick beds of rock salt in places.
Dolomites and limestones of the Guelph, Niagara and Clinton	275 feet to 375 feet.
Shales of the Medina, Hudson River and Utica	750 feet to 1,050 feet
Trenton limestone	600 feet to 700 feet
Calciferous sandstone	30 feet to 50 feet.

while in the Niagara peninsula there is a considerable thinning of the Onondaga, but also a great thickening of the shales, as follows:

Onondaga	400 feet.
Guelph, Niagara and Clinton	300 feet.
Medina, Hudson River and Utica	1,550 feet to 1,850 feet
Trenton	660 feet to 690 feet.

EXPLORATION IN MATTAGAMI VALLEY

BY H L KERR

Introduction

In accordance with the instructions of Mr. T. W. Gibson, Director of the Bureau of Mines, I left Toronto June 1, 1905, to take an exploratory party into that part of the great Clay Belt, which lies west and northwest of lake Abittibi and embraces the valleys of the Abittibi, Frederick House and Mattagami rivers.

Mr. Archibald Henderson, B. A., of Toronto University, accompanied the party, in the capacity of agricultural expert.

The object of the expedition was to collect information regarding the mineral, agricultural and timber resources of the region, and in fact all such data as would tend to show its suitability for settlement, and its possibilities as a wealth-producing part of the Province.

Having arrived at Sudbury, June 2nd, the balance of the week was spent in engaging voyageurs and in ordering supplies. On June 6th we left for Metagama station on the Canadian Pacific railway, where unfortunately we were delayed four days, owing to some of our outfit not having arrived from Toronto. On June 10th we started with our two canoes and about three months' provisions, up the Spanish river and arrived at the Hudson Bay Company's post, Fort Mattagami, on June 15th, where we were royally welcomed by the genial factor, Mr. Miller, and the Government fire rangers. A day was spent here making some necessary changes on our canoes, after which two days' paddling brought us to Niven's base line of 1899, where work was begun.

From here north to Niven's base line of 1900, we followed the Matagami river, making numerous overland trips into all parts of the country not previously explored, besides going up all the navigable tributaries of the stream.

Most of the season was occupied with work on the Mattagami, but we were enabled to spend a couple of weeks in the townships being subdivided on the Abittibi and Frederick House. The party returned by way of Night Hawk and Montreal rivers, reaching Latchford during the first week of October. After storing our outfit with Mr. Grills, Crown Land Agent, New Liskeard, the members of the party left for their respective homes.

During the summer, besides the subdivision of certain townships, several base and meridian lines were run by Messrs. T. B. Speight, O. L. S., and A. Niven, O. L. S. These lines were used wherever possible as ties for our information. The plan followed in our overland trips was to take supplies for a few days and a light camp outfit along one of the lines and then tramp into the forest on both sides as far as the time would allow. In other places prominent features of the rivers were used as starting points. Mostly one-day trips were made, but occasionally they extended from two to six days. In this way the country was pretty thoroughly gone over, and the information gathered much more reliable than could possibly be obtained by remaining on the rivers.

As Mr. Henderson's report, which is published in this volume, deals in detail with the agricultural and timber resources of the region, anything I shall say on these subjects will be of the most general character, except regarding that part of the country examined after Mr. Henderson left the field.

The earliest report dealing with this part of the Clay Belt is one by Dr. Robert Bell on Exploration in 1875, between James Bay and Lakes Superior and Huron.[1] Since then several reports by the Bureau of Mines contain excellent accounts of different parts of the region by Dr. W. A. Parks,[2] G. F. Kay,[3] T. D. Jarvis,[3] J. G. McMillan,[4] and Archibald Henderson,[4] besides the report of the Exploration and Survey of Northern Ontario in 1900.

I shall discuss the results of my observations made during the season under the following heads:—

I. The Mattagami Valley:—Itinerary and Topographical Description of the country along the Mattagami river.

II. Region east of the Frederick House and Abittibi. Details of the Country Explored in the valleys of these rivers.

III. Economic Resources:—

(*a*) Soil.
(*b*) Forests.
(*c*) Peat Beds.
(*d*) Water Powers.
(*e*) Minerals.
(*f*) Game.

IV. (*a*) Geology and Petrography.
(*b*) Glacial Geology.

V. Conclusions.

In the first of the above sections I shall mention very little about the rocks, preferring to deal with those in the purely geological part.

I.—The Mattagami Valley

As the canoe route which we followed in reaching our territory up the Spanish and down the Mattagami, has been described in previous reports, I shall confine myself here to that part of the river and its tributaries passing through the country explored.

The Mattagami River

The Mattagami itself is a magnificent river ranging from three chains in width as it enters the Clay Belt to about ten in its lower reaches, and varying from four to twelve feet in depth. From its source to where it joins the Moose it offers unexcelled facilities for transportation purposes or as a canoe route for tourists. Indeed, it has few equals in the north country in these respects, as only occasional stretches of swift water or rapids sufficiently heavy to necessitate portaging occur. While few fish were taken from the river in the Clay Belt itself (although according to the Indians sturgeon, pike and pickerel are fairly plentiful) great numbers of whitefish, pike, pickerel and trout are found in the river and lakes throughout the rocky Huronian and Laurentian area to the south.

Shortly after the river crosses Niven's base line of 1899 it takes a big bend about 15° north of east for about four miles. At the end of this distance it swings abruptly north for another four miles where it turns west almost at right angles for probably six miles when it again changes a little west of north, which general direction it keeps as far north as we followed it.

On the west side of the river where it turns north, is the beginning of the Porcupine portages which were used later in the season in crossing to the Frederick House. A

[1] Geol. Sur. Can., Report of Progress for 1875-6.
[2] 8th Rep. Bur. Mines, 1899, pp. 175-196; 9th Rep. Bur. Min., 1900, pp. 125-142.
[3] 13th Rep. Bur. Min., 1904, Part I. [4] 14th Rep. Bur. Min., 1905, Part I.

full description of the Porcupine route will be found in G. F. Kay's report mentioned above. The slope of the river valley here is from thirty-five to sixty feet high but with a level stretch, in most places, just along the river before this elevation is reached. Occasional landslips occur here. The timber is chiefly poplar, balm of Gilead and jack-pine.

Overland trips prove the land embraced by the big bend to lie within the Clay Belt, not south of it as previously represented, while that along Niven's first base line and north and south of it is mostly rolling drift-covered country forested with spruce, jack pine, birch and poplar, often of large size, with frequent exposures of Huronian schists and greenstone.

With the exception of some swift water, shortly after the river crosses the base line before mentioned, canoeing on this part of the Mattagami is unsurpassed, no obstructions being encountered until we reach the Sandy portages, which are about three miles from where the river takes the bend to the west. Here is a continuous stretch of rough water for about a mile and a half, with three portages past the heavy parts of the rapids. The first portage is on the left hand side of the river just where a small branch enters from the south, and is well marked, level and 19 chains long. The fall here is about ten feet. This rapid may be run in high water, with a light canoe, by keeping along the left hand shore. About half a mile of swift water takes us to the next portage also on the left hand side of the stream. The fall here is more abrupt, being thirty-nine and a half feet, (aneroid), the water going over in two chutes with an island between. The portage is well marked and seventeen chains long. Some swift dangerous water must be run before reaching the last portage of the series. The river takes a slight bend here around an island, and this makes it impossible to see the landing, which is on the right hand side, until you are almost upon it. The trail, which is much shorter than the others, being only about eleven chains long, is over sandy soil, from which the portages take their name. The fall here is a little over twenty-nine feet (aneroid).

About a mile below these rapids, the Water Hen creek enters the Mattagami from the left. This stream, which is connected with a couple of small lakes to the south, has been used, in high water, by the Indians, to cut across the big bend of the river. When, however, we reached this point the quantity of water was so small and the amount of driftwood so large that we found it impassable, and I doubt very much if it is used at all by the Indians at the present time.

From here down the river to the Coffey, the first tributary of importance—a distance of about six miles—the Mattagami flows with an even, gentle current between rather high banks of stratified clay and sand. Numerous small landslips occur throughout this distance, but here as elsewhere only occasional rock exposures are seen. White spruce, cedar and poplars of fair size fringe the banks.

Niven's second base crosses the river at Mile VII, two miles below the Water Hen. Overland trips along this line and north of it reveal good rolling clay land, heavily timbered with white and black spruce, balsam, balm of Gilead, poplar and white birch for the first two miles. A number of deep ravines running north and south, together with considerable fallen timber made travelling rather difficult. From here west to Mile XX, the country changes considerably, numerous hills and ridges of schist and diabase being encountered. These hills vary in elevation from fifteen to over three hundred feet above the river country, and from the tops of them the region in all directions is seen to be rough and rocky. From the top of the highest elevation at Mile IX, 40 chains, the view extends away beyond the Mattagami to the Frederick House, the large sheet of water which may be seen being in all probability Night Hawk lake. The soil is coarse to fine sand, with occasional stretches of clay, and the timber is mostly small black spruce, poplar, birch and jack-pine with the latter predominating toward the end of the distance.

From Mile XVIII we went north for six miles, then east six miles to Niven's first meridian, and south along this meridian to the second base again. The soil along this stretch is mostly sandy, but with less rock until we again approach the base line. From an agriculural standpoint, this region, except the land in the vicinity of the Mattagami, is not of much importance. The timber is chiefly black spruce, dead tamarac and jack-pine, although other trees characteristic of the country are also found. Hurricanes of recent years have wrought havoc with the forest in this locality, windfalls for miles at a stretch, with scarcely a tree left standing, being encountered. About a mile before the meridian was reached we entered a jack pine brulé which was practically continuous for the first three miles on the line. This is possibly an extension of the same brulé north and south of Niven's second base on the west side of the Maattagami, in the townships of Reid and MacDiarmid.

The Coffey River

About four miles below Niven's second base the Mattagami receives a rather considerable tributary from the west, which I have named the Coffey, the present Indian name, Kamiskotaia-Sagaigan, being altogether too cumbrous. We ascended this river and some of its tributaries to Lake Kamiskotaia.

The river is shallow and about a chain and a half wide at its mouth. About half a mile up is a small rapid passed by a portage twenty-five chains long on the north side. Although the fall here is only five feet (aneroid) a high hill on the portage makes it rather difficult carrying. Less than ten chains farther up the river another portage, also on the north side, must be made. The portage is only eight chains long, but a very steep clay hill up at one end, and down at the other, makes heavy loads impracticable. About a quarter of a mile above this portage, the river receives a small tributary from the south, up which the route leads towards the lake.

A low shallow rapids in the main river, just where it receives this branch, and past which there is no portage, prevents further progress up stream. The river farther up has two main branches, both of which are crossed by lines run during the summer. However, although it appears to be a fairly good stream wherever crossed, the Indians use it very little, and only hunting trails are cut out alongside the rapids.

A few chains from the mouth of this small branch of the Coffey, a portage fifty-two chains long on the left hand side of the stream takes us past a long series of rapids. The portage ends at the foot of a high rocky hill, and the stream, which is only a few feet wide here, has been dammed by the Indians who live on Kamiskotaia. The stream is followed in a southwesterly direction about a mile and three-quarters to the next portage, which is on the right hand side. The portage which runs northwest is forty-eight chains long; and takes us to another small stream evidently also a branch of the Coffey. After pulling our canoes over half a mile of shallow rapids, we paddled up about four miles of rather dead water in a northwesterly direction until we reached the lake.

The country along the latter part of this stream is low and swampy with some spruce and dead tamarac, passing into poplar as the lake is approached.

Kamiskotaia Lake

The lake is a fine expanse of clear water, between two and three miles long, and a mile wide, stretching north and south. There are a number of small islands in it, some of which are cultivated by an Indian family living here, who grow potatoes and other vegetables. According to the Indians, pike and whitefish are plentiful in the lake

Numerous high hills of diabase occur south of the lake. The chief timber in the surrounding country is fair-sized white birch, white and black spruce, a few scattered white pine, balsam and dead tamarac.

A portage a mile and three-quarters long leads from the northwest corner of Kamiskotaia to another small lake beyond which we did not go, but we were given to understand by the Indian living here, that a poorly marked trail leads from this lake to the Coffey.

Entering the southeast corner of Kamiskotaia is a small stream leading in a southeasterly direction to a small marshy lake about two and a half miles away. About half way up, a twenty chain portage passes the only rapid on the stream. Niven's second base crosses the end of this lake about Mile XIII. It was in this neighbourhood that the hematite mentioned in a later part of this report was found.

Coffey River to Sturgeon Falls

The Mattagami continues nearly straight north from the mouth of the Coffey, with the same even current, for the next fifteen miles, at the end of which there is a mile of swift, treacherous water. Then a mile of more quiet water takes us to the Sturgeon falls in Mahaffy township. From about Concession I in MacDiarmid, north for probably six miles, the same extensive brulé mentioned above is seen. A hundred to two hundred yards back from the clay banks, the slopes of the river valley rise from thirty-five to forty feet above the water. The timber is black and white spruce, cedar, poplar and birch.

Nine miles below the Coffey a small tributary enters the river from the east, and just below the stretch of treacherous water mentioned, a somewhat larger stream enters from the same side. Neither of these streams is navigable.

Sturgeon Falls

These falls prove an effective barrier to the further progress of the sturgeon up stream, thus accounting for the present name given by the Indians. The water tumbles over hard olive green schist and diabase in two cascades, with a total drop of 15 feet 4 inches. The portage, which is very steep at the lower end, is on the east side of the river and only three or four chains long.

Overland trips were made in this section into the townships of MacDiarmid, Kidd, Reid, Carnegie, Crawford and Mahaffy, and into the country west of Niven's first meridian. The land throughout the area is chiefly good clay and clay loam, with black spruce of fair size making up the main part of the forest, although stretches of fine white birch, white spruce, balm of Gilead, poplar, balsam and dead tamarac occur. On a high rocky hill, with precipitous sides just south of M. XVIII on Niven's first meridian, a number of large white pine were found. From the top of this elevation, which I have named White Pine hill, and which is about three hundred feet high, the view extends for miles in all directions, and with the exception of a few isolated hills, away in the distance, the country appears as level as a prairie, and practically covered with black spruce forest. Back from the river, however, a great deal of the country is swampy, with two to four feet of decayed vegetation above the clay. Muskegs, some of which contain several feet of excellent peat, become more numerous towards the north.

Sturgeon Falls to Speight's First Base

Below the falls is about a quarter of a mile of swift, shallow rapids, and again about a mile below this a similar stretch. About a mile from the foot of the portage is a high clay hill, on the west side of the river, but elsewhere the banks for the first two miles are low and clad with small poplar and a narrow fringe of cedar. The country has evidently been burnt over in recent years. Shortly after this the river swings to the northwest for about six miles, and the timber changes to magnificent forests of poplar, making for the next eight miles one of the most picturesque parts of the

Mattagami. Then there are two miles of low banks with cedar, spruce and balsam before the poplar comes in again, and continues down as far as Speight's first base. Few rock exposures occur here, but occasional stretches of low shallow rapids make wading necessary in low water with canoes at all heavily loaded.

Two and a half miles below the north boundary of Mahaffy, a small tributary enters from the west, and six miles below this the White Caribou Head river also joins the Mattagami from the same side. These streams, although sufficiently large for canoeing, are filled with driftwood to such an extent as to be practically impassable. They were both crossed in several places on overland trips, and could no doubt be cleaned out without much trouble.

Overland trips were made along this part of the river north and south of the base lines run by Messrs. Speight, Niven and Patten, east and west of Speight's first meridian, as well as along these lines themselves and into the townships of Aubin and Nesbitt.

Here is the centre of the most promising agricultural land seen during the summer. For the most part the country is flat and covered chiefly with wet spruce woods of a somewhat better quality than farther south, but large areas of dry rolling clay and clay loam, with forests of large birch, poplar, balm of Gilead and an odd white spruce also occur. Although muskegs are more numerous than farther south, still there are very few of great extent. Fewer windfalls and thick tangled swamps, which make travelling so difficult in other parts of the country, were encountered, and practically no rock except an occasional boulder was seen. The section west of the Mattagami is particularly well drained not only by the tributaries mentioned, but by the upper parts of the Muskego and Poplar Rapids, and offers splendid possibilities for future settlement.

Speight's First Base to the Muskego

For a mile below Speight's first base the river is much the same as before the line was reached. At the end of this mile Locn portage—on the west side and 12 chains long—passes a rapid which is the beginning of about three miles of almost continuously bad water, that necessitates in all four portages. The drop in the river here is about 18 feet (aneroid). The beginning of the portage across country to Driftwood creek is on the east side of the river just at the foot of these rapids. This route to the Driftwood is used very little, as there is about seven miles of portaging over a poorly marked trail, which in places is very wet and heavy.

Half a mile of swift water full of boulders must be run before the next portage past Davis rapids is reached. The portage is on the east side, and is 14 chains long. At the foot of these rapids the first Laurentian rocks were found, the country up to this point being in the Huronian belt.

For a quarter of a mile below this, the current is swift, with many boulders. Then follows a mile of good paddling to the Yellow falls. Here the river passes over a ridge of gneiss and diabase in four lateral cascades, followed by a stretch of swift, dangerous water for another mile to Island portage. Island and Yellow falls are very similar in appearance, but in the former, one of the chutes is separated from the other three by a small island, over which the portage leads to the foot of the falls. The portage at the Yellow falls is on the west side and is about 10 chains long, being a little longer than the Island portage. The drop in the river from the head of the chute to the foot of the rapids at the lower end of the portage is 27 feet (aneroid) while the difference of level at the Island falls is 22 feet, although the falls themselves are only about 18 feet and 15 feet respectively. Below Island portage another mile of swift current takes us to quieter water, which continues until the mouth of the Muskego is reached. From the Yellow falls to about Patten's meridian, which is a mile south of where the Muskego enters the Mattagami, low clay banks with small balsam, cedar, spruce and poplar are characteristic, while for the balance of the distance, large poplar predominates. Frequent exposures of Laurentian gneiss occur here.

The Muskego River

The Muskego enters the Mattagami from the west, about a mile north of Patten's most northerly base line. It is about a chain and a half wide at its mouth. The river was ascended to about six miles above Speight's first base, a distance of possibly 22 miles, beyond which log jams and shallow rapids prevented further progress. For the first mile and a half from its mouth the course of the river is almost straight west through splendid clay land, heavily timbered with poplar and spruce. Following this for about the same distance the river flows through similar country from the north-west, at the end of which there is a big bend, and from here as far as we ascended it, the general trend of the stream is from the south. The valley of the river is in no place more than seven chains wide, with banks ranging from thirty feet in height, near its mouth, to about fifteen in the upper parts of its course. It is very probable, as its name suggests, that it takes its rise in some of the larger muskegs of the district. About two and a quarter miles from its mouth, a ten chain portage on the south, is necessitated by a small rapid over Laurentian boulders. This portage is evidently not much used. A little over a mile from here is another portage of the same length, just recently cut out, also on the south side. From the upper end of the trail a small chute is seen about ten chains farther up, past which the canoe must be lifted. With the exception of these three, and another short portage, which we cut a few miles farther up, no portaging is necessary. However, a great many shallow rapids which must be waded, besides a great deal of driftwood in places, make progress very slow. A small amount of work would easily clear the river of this driftwood and then, particularly in high water, the stream would be fairly good.

Half a mile south of the chute mentioned above, Patten's last base line, of which Speight's second base is a continuation, crosses the river about Mile 16, 15 chains. Five miles above this a tributary from the west joins the Muskego. This branch is also filled with driftwood and would be of very little use for canoeing.

Overland trips in the region east and west of the Mattagami, between Speight's first and second base, and Patten's two base lines, prove the country to be even more promising, from an agricultural standpoint, than the section south of it. Muskegs cover about the same area as farther south, but fewer wet spruce woods exist. The land here is much drier than any seen so far, for not only have we the Mattagami passing through the heart of the district, but the Muskego with its tributaries on the west, and Driftwood creek on the east, provide splendid natural drainage for the whole area.

Dry rolling clay land with large poplar, white birch, balm and spruce occupies the whole of the country between the Muskego and Mattagami, and is undoubtedly the best land seen during the season. With the exception of a few granite hills on Patten's meridian, east of the Driftwood, and a high clay ridge, a couple of miles south of Mile 7 on Speight's first base, the country back from the river is practically level. Here and there throughout the district low ridges of moranic origin were also seen

Driftwood Creek

The lower part of this river has been described by Dr. Parkes[5] and the upper part by A. G. Burrows[6]. Although we did not take our canoes across, the portage from the Mattagami was traced out, and the river itself was crossed in several places. The route is used very little by the Indians In fact some of the Indians living on the Mattagami could not tell us where the portage left the river. Besides the seven miles of portaging mentioned above, no less than ten portages, none of which is very long, occur on the river itself before the Abitibi is reached. In the upper part of its course where crossed north of Patten's most southerly base, it is from one to one and a half chains wide. When it crosses this base, it consists of two branches, which meet about

[5]8th Bur. Min. Rep., 1899. [6]Exp. and Sur. of Northern Ont., 1900

three miles to the north. The banks of the stream where seen are somewhat higher than those of the Muskego, and the country through which it passes is made up largely of black spruce forests with only occasional stretches of poplar.

Muskego to Poplar Rapids

The Mattagami, whose waters have been augmented by many small streams from both sides, together with those mentioned above, has attained a width of about seven chains by the time the Muskego is reached. Just below this tributary is a stretch of swift, treacherous water demanding great care in running. Jump Over falls is two and a half miles below this. The river here, confined by two narrow channels, rushes over hard, cystalline gneiss with a fall of 19 feet (aneroid) in a distance of about a chain. The portage, which is called Smooth Rock, is on the east side over the rock close to the shore.

No more portaging is necessary for the next twenty-two or twenty-three miles, although one rapid, too dangerous to run in a loaded canoe, and considerable swift current, are encountered. At the end of this distance, the Poplar rapids or Mehkwanegon, as the Indians designate it, enters the river from the southwest, the Mattagami flowing about 10° north of west at this point. About two miles above the junction of the two rivers are three rocky islands in midstream. For the first eight or ten miles from the Muskego the river presents the same general appearance as formerly. From here down to the Poplar Rapids, the banks are lower, and the river timber chiefly small black spruce, cedar and poplar, and at the end of this distance, the river itself is probably ten chains wide. Niven's base of 1900 crosses the Mattagami just where the two streams meet.

Indians are not very numerous along the Mattagami in the summer time, but at this most northerly point we found two families busily engaged in building canoes. Ca-pa-tis, the only one of the lot who could speak a word of English, informed us that they used Poplar Rapids and its lakes as centres for their winter's hunting, but that game was becoming less plentiful every year in this locality. He also said that they went up to the Fort (Mattagami) twice a year, once in the spring with their pelts, and in the fall, to bring back their winter's supplies. He seemed much interested in our expedition, and gave us some useful information regarding the Poplar Rapids. He spoke of a large lake at the source of the river, which he said was very difficult to reach at that time of the year. This is evidently the lake discovered earlier in the season, more about which will be said later on.

Poplar Rapids River

This tributary of the Mattagami was ascended a distance of about sixteen miles, where we were obliged to turn back. Just where the stream enters the main river, Niven's base of 1900 crosses the Mattagami. The Poplar Rapids, like many other rivers in the Clay Belt, is wide and shallow, being probably an average of two and a half to three chains wide in the lower part, and only three or four feet deep in most places. The course of the river is almost due north, excepting for the last two and a half miles, when it swings to the northwest. No rapids of any moment were encountered as far up as we went, although in several places the river is so shallow that wading is necessary. In the lower part of its course the banks are low, and the river timber is small spruce and balsam, young poplar and birch, with a few cedar and occasional stretches of young tamarac. These tamarac were practically the only living representatives of these trees noted, although large dead tamarac are common throughout the whole area explored.

Speight's last base crosses the river about Mile 9. From here on, the country is higher and the timber larger. About two miles above this base a small lake occurs just west of the river. It is divided into two parts by a narrow ridge of land. On

this ridge is a clump of red pine trees of fair size. A few pines were also found east of the lake. In consideration of this almost unique occurrence, in that part of the country, I have named this body of water Red Pine lake. Just across the river from this lake is a small grassy pond. Two miles above this is a long shallow rapids, unprovided with a portage, and here we turned back.

Throughout its course numerous small tributaries enter the Poplar Rapids from both sides, most of which are undoubtedly connected with small lakes in the interior. Up one of these tributaries, from the west, about a mile below Red Pine lake, a route leads to the Groundhog river, which is about thirteen miles away.

Scattered along the river are several Indian wigwams and camping grounds, which in all probability, mark stages in the travels of the Indian Ca-pa-tis and his family, to and from their hunting grounds on the lakes above.

Red Pine Lake to Lake Clement

Instead of going up the river past Red Pine lake, a short portage must be made from the south end of the lake, into another lake about twenty-five chains long. From the west side of this a twenty-chain portage leads south to a lake about a mile in extent, and from the southerly end of this latter lake, is a thirty-chain portage running almost due east to the river again. About two miles above this is a lake about the same size as the last one, then a three-mile stretch of river with four short portages, to another small lake. From here there is a one-chain portage, by a fall 8 feet high, and about a quarter of a mile of paddling to lake Clement.

This is by far the largest lake discovered during the summer and was first seen by Mr. Henderson, in one of our overland trips, several days before, and is crossed by Speight's line. The lake is 15 chains wide where the line cuts it, and is 20 feet deep in the centre. It extends north and south for three miles, the line crossing it about a mile from the south end. Several outcrops of Laurentian rocks occur along the shores.

Overland excursions were made into various parts of the country, east and west of the Mattagami, between the Muskego and Poplar Rapids. Details of these expeditions appear in Mr. Henderson's report.

The general elevation of the country after the first four or five miles is less than above the Muskego. Fewer areas of rolling poplar lands are seen, and wet spruce woods and swamps and muskegs become correspondingly more numerous. A great forest fire, a few years ago, destroyed all the timber of any size in the district north of Speight's last base, east of the Mattagami. Between the Mattagami and the Poplar Rapids the country is drier than on the east, the drainage being considerably better. However towards the far north, the land is very low. Despite the disadvantages of small timber and wet land, the soil is about of the same quality as farther south and in time may prove of value for farming.

Some of the overland expeditions during which the above information was collected were made while going down the river, and others were made on our way back. We pursued this course in order to have as many miles of base and meridian lines as possible, to which to tie our information.

II.—East of Frederick House and Abitibi

About the end of the first week in September we left the Mattagami and crossed to the Frederick House by the Porcupine portages. At this season of the year we found the trails between the various bodies of water to be in rather good shape, but the upper end of the Porcupine river was very low, and in places difficult to navigate.

Upon reaching the Frederick House we went down the river to the end of the three chutes in the township of Mann. Here we left our tents and cached most of our supplies, and with a light outfit went down the river to the north boundary of this

township. From here we travelled by lines, to be designated below, through the townships of St. John, Pyne, Mortimer, Fox and Brower, and back to the Frederick House. The rest of the townships subdivided in this locality this year were worked over by Messrs. McMillan and Henderson in 1904.

From the Frederick House to the southwest corner of St. John the prevailing forest after leaving the river timber is small black spruce growing on good clay loam. From here we travelled east three miles to the line between lots VI and VII, and found spruce swamps with fair sized trees most of the way. However, the west side of lot IX is drier, with larger timber among which are some fine white spruce. Practically all the south end of lot VIII is a muskeg with poor peat. Beyond this the land is drier.

From here we went north two miles. The first twenty chains is dry spruce with fair timber, followed by half a mile of swamp, the balance of the mile being like the first quarter. This continues for the first twenty chains of the next mile, while the rest of this mile is open muskeg with seven feet of good peat at the corner post, which is marked "con. II and III lot VI and VII." From here we proceeded east to the Abitibi river, for the first mile through the same muskeg, followed by a quarter of a mile of spruce swamp; thence to the post between lots II and III was drier country timbered in patches with large white and black spruce, cedar and birch, but for the most part consisting of spruce swamp, which continues for the next half mile and is succeeded by dry river country up to the Abitibi, with the large trees always found near the rivers here. Wherever the soil was sampled through St. John it was always found to be good clay or clay loam, although frequently in the swamps it was under two to four feet of decayed vegetation.

Pyne and Mortimer

Having crossed the Abitibi on a raft we proceeded east through the townships of Pyne and Mortimer. The first mile we found magnificent forests of white and black spruce, white birch, balsam, poplar and balm of Gilead, but with large black spruce predominating towards the end of the mile. Several deep ravines here, running north and south, make travelling rather arduous. The soil is uniformly good clay loam. Practically the same class of soil and timber prevails through lots X, IX, VIII, VII and VI, when the country becomes lower again with small black spruce predominating as far west as the beginning of lot I, when we once more have higher country. Lot II is almost all muskeg.

From here we continued east along the line between concessions II and III into Mortimer. After the first ten chains there is a forty-chain muskeg followed for the balance of the mile by dry spruce woods with large timber, among which is a great deal of dead tamarac. This dead tamarac is found almost invariably associated with the spruce throughout the whole area. The spruce woods continue for the first ten chains of lot X, and for the balance of the mile through lot IX the timber is larger and more varied, splendid white spruce, balsam, birch and poplar being associated with the black spruce. Just beyond the post between lots IX and X is a small clear water lake with a portage from the north end leading to another lake, a short distance away. These portages appear to be used a great deal. One of my Indians said it was in all probability a dog trail used in winter for travelling north, besides being used in summer for voyaging.

In going round the north end of this lake we struck the line between lots VIII and IX, and travelled north in some splendid forest through concession III to concession IV, when we again turned east. After ten chains of the same forest we passed into wet spruce woods again with fair timber, which continues up to the end of the mile. We were now in the centre of the township, and went north from here between lots VI and VII. The last 60 chains of the first mile is an extensive muskeg. This is followed for about fifteen chains by spruce swamp, when again muskeg comes in and continues to

the end of the mile. We were unable to find the depth of this bog. Muskeg continues for the first twenty-five chains of concession VI, and is succeeded by a quarter of a mile of swamp, with the balance of the mile dry spruce woods with large timber. We were now on the boundary between Mortimer and an unnamed township on the north. Wherever the soil was tested it proved to be good clay and clay loam.

From here we went west. Lots VII and VIII proved to be dry spruce woods of good quality over splendid clay loam. Lots IX and X are swampy with smaller spruce, and about ten chains of muskeg. This is followed through lots XI and XII by wet spruce woods for east half of lot XI, and the balance of the mile deep muskeg with only fair peat.

This same muskeg continues through lot I on the boundary between Pyne and Fox, followed by wet spruce woods for all but the last six chains through lot II. The muskeg which begins here continues for the first half of the next mile, then there is thirty chains of swamp, with muskeg again for the balance of the mile, and on through lots V and VI to the end of the next mile. The peat in this last bog is of good quality.

Fox and Brower

From here we went north through Fox on the line between lots VI and VII. The same muskeg continues for twenty chains, when the country becomes drier until we find the first twenty chains of the last half mile heavily timbered with spruce, birch and balsam. Wet spruce woods over splendid clay loam is found for the next mile, and for seventy chains of the next, when the country becomes drier with large white spruce, poplar, birch and balsam to the end of the mile.

We now proceeded west between concessions III and IV through Fox and four miles into Brower. The first mile was through splendid forests of white spruce and birch, with somewhat smaller timber through the last half of lot VIII. The soil here is sandy, with many glacial erratics scattered over lot VIII. This continues for ten chains of the next mile, when the same large timber comes in again and is found to the end of the mile. Similar sandy soil continues to the end of lot XI, when soil of a better quality comes in.

The large timber found in lots XI and XII Fox, continues half way through lot I in Brower, followed by small spruce and poplar for the balance of the mile, and through the first half of the next mile. Then once more we are in the river country, with the Abitibi passing through the middle of lot IV. Lots V and VI are dry spruce woods with good clay loam, as also are lots VII and VIII. From here we turned south along the line between lots VIII and IX, and found the same dry spruce woods with fair-sized trees to continue for the first mile and a quarter, when larger spruce, birch, etc., obtain for the following mile, succeeded by a twenty-chain muskeg in concession I, with spruce woods for the balance of the distance to the boundary between Brower and St. John.

St. John and Hanna

We continued south into St. John along the same line. After the first ten chains, a great muskeg begins, stretching south for nearly a mile and a half. The balance of second mile is wet spruce woods with fair timber. The first half of concession IV is also muskeg, followed by a mile of large black spruce forest over good soil. The last forty chains of concession III is another muskeg with eight feet of good peat.

From here we turned west for two miles. The same muskeg continues for a quarter of a mile, giving place gradually to spruce woods with large timber which continues to within ten chains of the end of the two miles. We now travelled south along the boundary between St. John and Hanna for two miles to the corner post between St. John and Mann. The first fifty chains is muskeg with eight feet of fair peat, and the

balance of the distance to the corner post mentioned is wet spruce woods with fair timber and clay soil under two to four feet of decayed vegetation. From here we proceeded west to our starting point, the Frederick House, along the north boundary of Mann.

From the above notes collected in an overland tramp of about sixty miles, I should infer that there is a great deal more muskeg in this part of the country drained by the Abitibi and Frederick House than in any part of the Mattagami country explored. The travelling, on account of these great stretches of muskeg, and the absence of windfalls and wet tangled swamps, is also much less arduous. However, the soil which was examined at the end of each mile excepting in the muskegs themselves was found to be uniformly good clay and clay loam, excepting in that part of the township of Fox where the glacial deposits above mentioned occur

III.—Economic Resources

The Soil

As shown in the above general account of the country, the chief value of the district is in its agricultural possibilities. The whole region, north of Niven's third base, is particularly promising in this respect, while south of this the townships of MacDiarmid, Kidd and Jamieson, and the area contained by the big bend of the Mattagami, are almost, if not quite, equally so. According to Mr. A. Henderson's report, published by the Bureau of Mines in 1905, Jessop is also an average township. The small areas of sand, noticed here and there, would prove an advantage rather than otherwise in the country, if settled. South of Niven's third base, and west of his first meridian, the soil where examined was chiefly sandy and stony, with much more rocky country than seen elsewhere, but even here are some stretches of good clay.

The temperature records obtained during the summer, which are given in Mr. Henderson's report, show that the climate is quite suitable for farming, and undoubtedly when the country is cleared, the mean summer temperature will be considerably higher.

Forests

Black spruce makes up by far the greater part of the forests. The largest of these trees seen are probably from ten to twelve inches in diameter, but the great bulk of the timber of this type is much smaller. From one end of the country to the other, tamarac of about the same size is usually associated with the black spruce, but unfortunately the tamaracs are all dead.

The chief use of the spruce is for pulp wood, but where the trees are of any size, rough lumber is made from spruce in other parts of Ontario. However, for neither purpose could it be advantageously taken out at present. When the numerous waterfalls and rapids on these northern rivers are developed for power, we may expect to see great pulp industries in this part of Ontario. The tamarac may be used for heavy lumber, but probably the most likely use for a great deal of that in the north will be for railway ties.

The next tree in importance is the poplar, which grows to much greater dimensions than any other tree in the country, attaining a diameter of fifteen to twenty-two inches. White birch and balm of Gilead, equally large, are usually found with the poplar. Jack-pine is confined to the sandy districts of the south, where areas of fairly large trees were found. White spruce and cedar of large size were both found scattered over the country, but neither tree is at all common.

Poplar, like black spruce, is used largely for pulpwood, but for lumber of any kind is of very little account. Balm of Gilead makes about the same quality of timber as our basswood. Jack-pine when of any size makes good lumber for almost any purpose, and of course birch, cedar and white spruce, for certain uses, are unexcelled. So taken altogether, the forest wealth of the Clay Belt may in time prove to be of no inconsiderable value.

Peat Beds

Although these peat beds may seem to be a drawback rather than an advantage, at the present time, if the country ever becomes settled, they will eventually prove of enormous value. The trees, native to that northern latitude, are not of the best quality for firewood, and unless coal should be discovered close at hand, the obtaining of fuel will prove to be a very live question not many years after the land is taken up. Scattered all over the country are small muskegs and some large ones, containing peat of an excellent quality. The depth of these bogs varies from three to fifteen feet, and they contain fuel sufficient for the needs of the country for hundreds of years. As it is now pretty generally acknowledged that peat may be prepared for the market at such a figure as to have a slight advantage over coal,[7] in summing up the resources of the country we must give their true value to these apparently worthless muskegs.

As stated previously, the greatest muskegs are in the northern part of the district. Besides those large deposits of peat, already mentioned as occurring east of the Frederick House and Abitibi, note may be made of a few of the largest in the Mattagami country. In addition to those enumerated, it must be understood that there are a great many small ones also containing excellent peat. A large muskeg occurs south of Miles IX and X, Speight's first base line, which is in all probability the same as crossed west of here by the second meridian run by the same surveyor. Frequent stretches of peat beds of considerable size were found in the neighborhood of Speight's last base line, both east and west of the Mattagami, near Patten's two base lines.

The results of analyses made by A. G. Burrows of the Provincial Assay Office, Belleville, of several samples of peat, taken from various parts of the country, show it to be strikingly uniform in quality, all over this part of the Clay Belt. The following table proves the peats of the north to be comparable with those occurring in southern Ontario, which are on the market at present.

No. of Sample.	Locality	Water.	Volatiles combustible.	Carbon.	Ash.
		Per cent.	Per cent.	Per cent.	Per cent.
1.	Tp. Mortimer	11.56	62.06	20.00	6.38
2.	Mile X., Patten's last base	12.32	63.76	19.15	4.77
3.	Tp. Mortimer	12.52	61.93	19.35	6.20
4.	Tp. Crawford	11.31	62.49	19.40	6.80
5.	Tp. St. John	11.44	63.32	21.12	4.12

Water Power

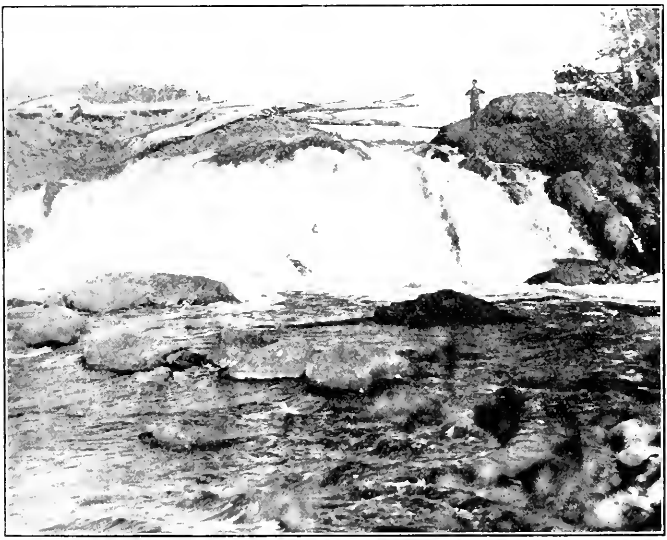
Several waterfalls of sufficient magnitude to offer possibilities for the development of power occur on this part of the Mattagami. Now that the country is being opened by the construction of railways, we may reasonably expect to see, in the not very distant

[7] See Peat Fuel: Its Manufacture and Use, in 12th Rep. Bur. Min., 1903.

future, large pulp mills and plants for the preparation of the products of the great peat beds for the market as well as other industries in this northland, in which case these water powers will prove of great value.

Sturgeon falls, situated in the second concession of the township of Mahaffy, is probably one of the most important. Here the whole force of the river in concentrated in a channel about a chain wide, having a total drop of about fifteen feet four inches in a distance of about forty yards. The large mass of unyielding schist and the diabase dike, which are the cause of this torrent, would materially assist in the construction of a dam at the foot of the falls. Roughly estimated, the probable horse power capable of being developed here is between 4,500 and 5,000.

Next in importance is the Jump-over falls about four miles north of the mouth of the Muskego. The water here is confined to two narrow channels each less than twelve feet in width, and has a drop of nineteen feet in a distance of a chain or a chain and a half. Conservatively estimated, the horse power here is about 4,000



One of the chutes, Island Falls, Mattagami River.

Two other possible water powers very similar to each other are the Yellow falls, four and a half miles below Speight's first base, and Island falls, a mile or a mile and a half farther down. These are two of the most striking and picturesque scenes on the whole river. In both cases the water comes over in four lateral chutes with an abrupt descent of eighteen feet in the former case and fifteen feet in the latter. There is a continuous rapid from the Yellow falls to Island falls, and if a dam were built at the head of the latter enormous power could be developed. With the means at our disposal for making measurements, it was difficult to obtain an accurate estimate of the probable horse power.

Besides these four, there are several of lesser magnitude, the most important of which is the falls and rapids at the beginning of the second of the Sandy portages, while that part of the rapid passed by the third portage might also be of value in this respect. The construction of proper dams would be the greatest difficulty in both these cases.

In addition to these, there are several short rapids where the drop is sufficiently abrupt to be of value for small plants.

Yellow Falls, Mattagami River.

Minerals

A few traces of economic minerals were found, but no deposit of value was located. My observations, however, would lead me to conclude, both from the disturbed Huronian schists with the masses of eruptive diabase, in the southern part of the area explored, and the traces of minerals seen in the same area, that the region may be well worth prospecting. South of a small lake near Mile XIII, on the most southerly base run by Mr. Niven this year, a vein of specular hematite about an inch wide was found, while on the lake itself a small quartz vein, containing chalcopyrite was seen, besides a large piece of iron pyrites not in place. The latter we know is a mineral very readily

decomposed, so that this specimen could not have come from any great distance. The rock here is fine grained greenish schist, striking north and south and dipping vertically. Unfortunately the time at our disposal would not allow of a very thorough examination of the region.

Besides the above, a trace of ruby silver was found on a rock exposed two and a half miles below the mouth of the Water Hen on the Mattagami. The rock here was a fine grained slate. Here, back from the river, the rock was covered by thick beds of clay so that prospecting in the immediate vicinity would not be easy.

Game

According to several Indians with whom we talked, game is not so plentiful as it used to be, and Mr. Miller at Fort Mattagami also stated that the furs brought into the fort are becoming less in number each year. However, moose seem to be fairly numerous in all parts of the country, while there are a few red deer in the rocky area to the south. Numbers of bears were seen on the rivers during the summer. At one time it must have been a great country for beaver, for their old dams were found on almost every overland trip, while quite frequently fresh work was seen. Both martens and wild cats are plentiful, as also are minks and muskrats in the streams and rivers. The chief fish in the rivers are pike and pickerel, while below Sturgeon Falls sturgeon are plentiful, but on the whole the Clay Belt is not noted for its fish.

IV.—Geology and Petrography

Probably at one time a great lake, dammed in the north by the retreating ice, and in which the stratified clay and sand now covering the country was deposited, existed in this part of Ontario. Since that time many of the rivers have eroded deep valleys and in a few places along their courses have exposed the underlying rock. Most of the small lakes, left as remains of the larger lake, have been gradually filled in by the encroaching vegetation until we have today the many muskegs scattered over the whole region. All stages in the history of these muskegs may be seen, from the small lake, through the open shaking bog, to the muskeg covered with small scrub spruce, where the growth of a century is represented by trees two or three inches in diameter.

Probably over ninety per cent. of the rock seen during the season was south of Niven's second base. Here, also, the superficial deposits are more largely sand and gravel. While the bulk of this sand and gravel is undoubtedly the result of wave action on the rocky shores of the glacial lake, or the heavier deposits made by the rivers themselves near their mouths, still a great deal of it is material left by the retreating ice.

Back from the river valleys, north of this, the country is practically level. However, besides the inequalities, caused by the erosions of the rivers and their tributaries, occasional rolling areas of boulder clay, above the general level of the country, are found, and here and there a few high rocky hills are seen.

With the paucity of material at hand, it is impossible to work out the relationships of the various rocks in detail. As stated above, practically all the rock seen was along the rivers, and even here the exposures were by no means numerous.

A Belt of the Huronian

The Huronian belt which begins towards the foot of Kenogamisse continues north as far as Loon portage on the Mattagami, where the first Laurentian rocks were seen. The contact between the two formations was also located south of this on the Muskego river. The Laurentian stretches from here to Poplar Rapids, as far north as our exploration extended.

Many of the rocks occurring in this part of the Clay Belt have been discussed by previous writers whose explorations took them through some part of the district. However, for the sake of continuity, I shall describe the various rock types for the whole area, mentioning their occurrences. Most of the rocks collected were sectioned and studied microscopically after coming from the field.

On Niven's first base at Miles 21 and 23 is a fine-grained greenish-gray rock, which extends southwest from the line. This same rock, or varieties of it, occur at several points along the Mattagami as far north as the Coffey river. Microscopically, it appears to be of volcanic origin, being in all probability devitrified glass. The ground mass is fine plagioclase crystals, with quartz grains of larger size scattered over it. However, in some specimens the development of the feldspar and quartz seem to be about equal. In others a certain amount of carbonate has been added. Some of the chief occurrences of this rock are just beyond the Porcupine portage, along the Sandy portages to the first part of the route to Kamiskotaia, and about two miles west of the river on Niven's second base.

Associated with this rock on Niven's base is a quartz diorite, which has been badly crushed, developing a distinct cataclastic structure. In places, too, in this greenstone is a well marked graphic intergrowth of quartz and feldspar.

Just at the beginning of the first of the Sandy portages is a fine-grained mica schist striking 30° south of east and dipping 60°. This same schist occurs at several places along this series of rapids, always with approximately the same strike and dip. In several places along this part of the river small veinlets of quartz cut this schist as well as the quartzitic rock described above.

At the beginning of the second Sandy portage is a splendid example of a sheared porphyrite. The pressure must have been applied when the rock was in a plastic condition, for the large plagioclase crystals present have not been affected, although all the other constituents of the rock have been considerably disturbed. Associated with this rock is a dike of diabase striking north and south. Diabase is of frequent occurrence all along the river throughout the Huronian, and is almost always found in the neighborhood of the rapids and waterfalls.

At the foot of the last of the Sandy portages is a fine-grained olive green rock composed of feldspar and quartz with the original crystals badly broken up. A small quartz vein striking 10° south of east cuts through the rock.

About two miles below the mouth of the Water Hen creek is a pale green slaty rock of exceedingly fine texture. It was here we found the trace of ruby silver mentioned in another part of this report.

Eruptive Rocks

At the end of the third portage to Kamiskotaia are some high hills of a light colored felsite, associated with a darker rock evidently belonging to the same volcanic series mentioned above. In several places along this route are exposures of diabase, and in the neighborhood of the lake itself are several high hills of the same rock. This diabase is of two distinct periods of eruption. The contact between the two was traced for a considerable distance on the brow of one of the elevations.

Just where the river leaves the lake is an exposure of a dark rock of granitic texture composed of quartz, hornblende with chlorite, and magnetite. This is a very interesting exposure, situated as it is in the centre of a great mass of gabbro and diabase. It is somewhat difficult to suggest a reason for its presence there, but it may represent the centre of the original mass of eruptive, and is made up of those constituents which ordinarily crystallize last. However, it may be connected with a rock which

looks much like it, found several miles away on Niven's first meridian between Miles VII and VIII, but the latter rock, besides having all the constituents of the former, has considerable plagioclase and crystals of apatite or nepheline, probably the latter, so that the connection cannot be very intimate.

Between Miles XII and XIII, on Niven's second base, is a small lake, near which we found the narrow vein of specular hematite. At the south end of this body of water is a fine grained reddish rock composed of chlorite, some hornblende, calcite, leucoxene and decomposed feldspar. Cutting through this rock, which is evidently a greatly changed diorite, is a narrow quartz vein striking north and south, and containing copper and iron pyrites. Inland from this is a typical green schist and about a quarter of a mile farther is a rock of exceedingly fine texture whose essential constituents are plagioclase, hornblende changing to chlorite and epidote, with the accessory minerals quartz and magnetite. Running north and south through this is the small vein of hematite. The presence of the epidote here suggests a sedimentary origin for the rock, as epidote is frequently developed from the decomposing hornblende in the presence of calcite. Varieties of the same rock occur in the lake itself.

Diabase and Gabbro

Along this same base line both east and west of the above mentioned lake are several ridges and hills composed chiefly of diabase and gabbro. But at 9 M. 40 chains is a high hill of a fine hornblende schist with the rock striking 135° and dipping vertically. North of this base, on the meridian, occurs the same fine-grained volcanic which was found in so many places in this part of the country.

Near the mouth of the Coffey in the Mattagami is a small low island composed of diabase and calc schist. A small vein of calcite striking east and west cuts through the schist, but the vein matter is so badly decomposed that its discovery was only accidental. From here for the next eight miles calc schist, resembling this more or less, occurs several times. Besides this schist a few exposures of schistose, quartz diorite and ordinary diabase are found here, and on as far as Sturgeon falls. In this diorite, besides the essential minerals, a little calcite and epidote are usually present.

The only rock found *in situ* away from the river, in this locality, is that which forms White Pine hill just south of the southwest corner of Reid township. The rock is of very fine texture, and made up of poorly developed hornblende in a fine ground mass of plagioclase with very little quartz.

A rather interesting series of rocks is exposed at Sturgeon falls. At the lower end of the falls is a mass of diabase which is probably a dike, although this could not be made out satisfactorily. At the upper end is a hard fine-grained olive green rock. The metamorphic effect of an eruptive on the neighboring rock as well as the variety of texture developed by different rates of cooling, is beautifully illustrated here. Just at the contact, egg-shaped mosaics of quartz grain and porphyritic aggregates of feldspar, have been developed in the upper rock, besides which single quartz and plagioclase particles and hornblende may be readily made out under the microscope. These same conditions obtain to a lesser degree some distance from the contact, while at the extreme upper end of the exposure the rock is so fine-grained that very little can be determined positively. At the contact the diabase, although readily determined, is fine-grained passing into a coarser grained type a very short distance away, and a few feet from the contact into a typical coarse textured diabase. Besides augite and the well-developed ophitic structure of the plagioclases essential to all diabases, there is a beautiful micrographic intergrowth of quartz and feldspar.

About a mile below the falls is an exposure of a medium-grained gneissoid rock composed of hornblende, epidote, quartz and badly decomposed plagioclase feldspar.

From here to Loon portage, the rocks are chiefly hornblende or green schist and diabase.

Tourmaline Schist

Just at the beginning of the Loon portage is a finely laminated tourmaline schist composed of quartz, calcite, a very little biotite and lath-like crystals of beautifully pleochroic tourmaline. The rock strikes 34.5° south of east and dips vertically. It passes into a more massive biotite schist with an occasional crystal of tourmaline and some calcite, which gives place towards the lower end of the portage to a finely laminated hornblende schist with the same strike and dip. Numerous small stringers and veinlets of quartz occur in the middle number of the series. So far as known this occurrence of tourmaline schist is unique for this part of Ontario.

A short distance below this portage is an exposure of diabase and the next rocks seen, which are in the neighborhood of Davis rapids, are Laurentian.

The elevation of the Laurentian is somewhat less than that of the Huronian. The rocks are rather monotonous and are made up largely of light colored gneisses and granites. The only exposures of gneiss seen were along the river, and in the majority of cases these would be hidden by high water. These rocks were found to be composed chiefly of quartz and microcline, with very little hornblende. In some cases, instead of microcline, orthoclase was associated with the quartz, while in others the plagioclase feldspar occurred. In those rocks in which plagioclase was present, the mutual reactions of the elements composing the basic bisilicate and the plagioclase has resulted in the formation of epidote. The latter mineral is quite prominent in the gneisses found from the beginning of the Laurentian at Davis rapids to about four miles below Island portage.

The chief eruptive here is granite, although diabase, which was found so largely to the south, also occurs quite frequently. In the granites very little orthoclase is present, the feldspar being chiefly plagioclase and, in several places, as at Island portage, the hornblende is replaced by epidote.

Granite Bosses

The only elevations of any magnitude throughout this part of the country are formed by rounded bosses of granite. Several of these occur east of Driftwood creek on Patten's meridian of 1904. The largest of these hills, which is situated at Mile 39 on this meridian, is about one hundred and fifty feet high. West of the Mattagami, about two miles southeast of lake Clement, is a low rounded mass of granite covering an area of several hundred acres. In places this rock is pegmatitic in structure.

Some of the granites are very interesting from a petrological standpoint. One of these was found five miles west of the Mattagami near the probable position of Speight's last base, but as the line was not run at the time, the exact locality cannot be given. It is dark colored vitreous rock of granitic texture, and composed of fine crystals of hypersthene, some biotite, quartz, finely twinned plagioclase and magnetite. Both macroscopically and microscopically, it has a marked resemblance to the charnokite of Mount Thomas, Madras, India, the only difference being in the presence of plagioclase instead of microcline.

The rocks at Jump-over falls are rather interesting. Here the mass of the exposure is a light colored hornblende gneiss, with angular fragments of a darker colored gneiss, also found here, enclosed in it. There is as well an ordinary looking red granite containing segregations of epidote as large as three-quarters of an inch in diameter. These three rocks are most irregularly arranged in relation to each other, showing evidence of great disturbance. Cutting through the mass of acid rocks are two or three small veins of diabase from two to four feet in width and striking 30° north of east. Under the

microscope the hornblende gneiss gives further proof of some great change in the rock, subsequent to its original crystallization. The undulatory extinction of the quartz grains, the bent and twisted polysynthetically twinned feldspars often with included quartz fragments, the cataclastic structure developed in places, and the small cracks and fissures running through the rock, prove conclusively that some powerful dynamic force has greatly changed its original condition.

Any further detail in the description of the Laurentian rocks would he neither interesting nor profitable, as nothing of an economic nature was seen in them, and as the relationships of the various types could not be worked out with the information collected.

Glacial Geology

As stated previously, the whole Clay Belt is, in all probability, the direct result of the huge ice fields which once covered the country. But besides these vast deposits of stratified clay, we have more direct evidence of the ice age, in the glacial striae found on the rocks, in the occasional ridges of boulder clay, and the glacial erratics scattered over the whole region.

As rock exposures are not numerous, glacial striae were noticed in comparatively few places. However, their direction was always accurately determined. This direction varies from 12° west of south to 10° east of south, so that the ice must have been travelling nearly straight south here.

Ridges of boulder clay, and deposits of morainic origin, occur on Niven's first base, between Mile 19 and Mile 25, in several places along Speight's first base and south of it, and besides were seen occasionally on our overland trips away inland from the main rivers. Were it not for those glacial deposits the country, particularly north of Niven's third base, would have practically no relief. As it is, they embrace some of the most promising land of the area.

All through the Huronian are found glacial erratics from the north. These boulders, some of which show distinct glacial markings, are mainly granite and gneisses of various kinds, but occasionally limestone boulders were seen. In some of these latter Palaezoic fossils were noticed, chiefly corals and brachiopods.

Conclusion

In view of the probability that in the near future, railways will connect this part of Ontario with the rest of the country, its splendid agricultural possibilities and the various other resources outlined in the foregoing pages, combine to make the future of this part of the Clay Belt particularly promising. Undoubtedly settlement will he slow, and the earlier settlers have much to overcome, but there is no reason why land, situated in the same latitude as some of the most prosperous parts of the great west, should not some time in the future prove equally productive and support a large population.

In conclusion I take the opportunity of thanking Prof. T. L. Walker of Toronto University, for assistance and va..able suggestions in the preparation of this report.

AGRICULTURAL RESOURCES OF MATTAGAMI

BY ARCHIBALD HENDERSON

The region considered in this paper is a large portion of the Mattagami river valley between Niven's base line of 1899 and Speight's third base line of 1905.[1]

The report of the work accomplished is presented under the following headings:

I. Description in General of the Region.
II. Description in Detail of Overland Excursions.
III. Climate.
IV. Flora and Fauna.
V. Soil Specimens collected in the region.
 (a) Notes on localities of specimens.
 (b) Results of Chemical Analyses by Professor Harcourt, Ontario Agricultural College.
 (c) Results of Physical Analyses by Professor Reynolds, Ontario Agricultural College.

I. General Description of Region

The Mattagami valley is very similar to that part of the Clay Belt lying immediately to the east in the valleys of the Frederick House and Abitibi rivers. A somewhat exhaustive description of the latter area was given by the writer of the present paper in a former report;[2] hence it is necessary at the present time only to outline briefly that description, slightly changed in order to apply accurately to the Mattagami valley.

The valley of the Mattagami river, like that of the Frederick House and of the Abitibi, consists of six types of country, viz.: (1) Black spruce forest; (2) River bank; (3) Poplar knoll; (4) Muskeg; (5) Jack-pine plain; (6) Rock.

Black Spruce Forest

A very large proportion (sixty to seventy per cent.) of the valley of the Mattagami river is a black spruce forest. The predominant tree of this forest, as the name would imply, is the black spruce (*Picea nigra*). It averages in diameter only six or seven inches, whereas in the Abitibi region the same tree averages eight or ten. Tamarac (*Larix americana*) are also common, but are all dead. Balsam, (*Abies balsamea*) is another common tree in the spruce forest, but is always small and of little value. White spruce, (*Picea alba*) and white birch, (*Betula papyrifera*) are sometimes found in the drier portions of the black spruce forest.

The subsoil is commonly clay, clay loam, or heavy clay, rarely sand or sand loam, (soil specimens Nos. 7, 18, 19), overlying which is a layer of vegetable matter, a few inches to one foot thick and well decayed in most localities, two or three feet thick and peat-like in the wettest areas. A mixture of the commonest subsoil, clay or clay loam, and the overlying mould makes a good soil for agricultural purposes.

A variety of the black spruce forest type of area which was not seen in the Abitibi region is that described as occurring in Aubin, Nesbitt, Crawford and Mahaffy townships. The trees are smaller than usual and grow on a dry, heavy clay soil. (Specimen No. 22).

[1] These base-lines are in the latitude of mileposts 120 and 186 respectively on the eastern boundary line of Algoma.
[2] Report of the Bureau of Mines, 1905. Vol. XIV. Part I. "Agricultural Resources of Abitibi.

River Bank

The banks of the Mattagami river are commonly about forty feet high, the slope varying much in different localities. Their soil is clay, clay loam, or loam, (specimens Nos. 2, 15, 16, 20, 24), and, judging from the luxuriant vegetation as well as from the physical and chemical analyses, is the best soil of the region for agricultural purposes. They are clad with a forest whose most common tree is the aspen poplar

Typical view of poplar river bank country, Mattagami.

(*Populus tremuloides*) which averages twelve inches in diameter. The white spruce (*Picea alba*) averaging ten to twelve inches in diameter, is quite common, particularly along the river margin, and is a valuable timber tree. Balm of Gilead (*Populus balsamifera*) of about the same size as its near relative, the aspen poplar, is less common but is a valuable timber tree. White birch (*Betula papyrifera*) of somewhat smaller size is found in localities having a sandy soil, and therefore is not very plentiful. The balsam (*Abies balsamea*) is quite common everywhere, but the trees are usually small, averaging eight inches in diameter. White cedar (*Thuja occidentalis*) sometimes sixteen or twenty inches in diameter is found along the river margin, and in some localities is sufficiently common to be quite valuable. The growth of small plants is quite luxurious, thus indicating a fertile soil.

The river-bank type of country extends inland from the Mattagami for a distance varying from a few chains to a mile, averaging probably not more than thirty chains in the region explored.

In regard to soil and timber of the banks of the smaller rivers and creeks of the region, similar conditions obtain. The distance inland which the river-bank type of country extends usually varies directly as the size of the river.

Poplar Knoll

Here and there throughout the spruce forest is a slightly elevated area resembling the river bank type both in soil and vegetation. Like the latter, these areas are well drained and in this respect differ from the black spruce forest. The river bank and poplar knoll types together occupy about twenty per cent. of the whole region.

Muskeg

For a description of this type the reader is referred to the former report spoken of above, and to the section of this paper on drainage.

About fifteen per cent. of the region explored is of this type, and it is an interesting fact that muskeg and very wet spruce forest occupy a larger proportion of the northern part of the region than of the southern.

Jack-Pine Plain

The only jack-pine areas observed in the Mattagami valley are in the southwestern part of the region, viz.: along the southern boundary of the Clay Belt, and in the vicinity of lake Kamiskotaia.

The trees are small and would not average more than eight or ten inches in diameter. They were most commonly seen in rough rocky districts, and in only one locality, north of lake Kamiskotaia, was a jack-pine plain observed.

Rock

The outcrops of rock occupy only a very small proportion of the region explored, probably one or two per cent. Like the jack-pine areas they are most common in the southwestern part of the region, which, as the map of northern Ontario published by the Department of Lands and Mines shows, is in the neighborhood of the southern boundary of the Clay Belt. Elsewhere only occasional isolated rocky mounds or hills occur.

Drainage

The types of country occurring in the region explored called river bank, poplar knoll, black spruce forest, and muskeg represent three degrees of drainage, the first two being considered together. The river-bank and poplar knoll areas are well drained, and as has been stated, have generally clay, clay loam or loam subsoil, (the latter two being most common), with three or four inches of overlying organic matter in various stages of decay. Such soil will be available for crops as soon as denuded of forest growth.

The black spruce forest as a rule is poorly drained and has a subsoil of clay loam, clay, or heavy clay, the clay loam commonly occurring in the best drained parts of the forest, and the heavy clay in the worst. Above the subsoil is a layer of organic matter well decayed in the drier areas, peat-like and deep in the wetter. On the surface of this is a layer of moss mostly bryineous and only a few inches thick in the drier parts, sphagnous and a foot or more in depth in the localities where water pools are numerous. It is probable that clearing alone or some simple form of artificial drainage will be sufficient to render most of this type of country suitable for farming purposes.

Muskegs are areas which at the present time have little or no drainage. In the centre of the larger ones there is often a small lake. The depth of the moss and peat in such areas varies very much, frequently being ten feet or more in the larger ones, but in the smaller, which are by far the more common, generally being only five or six feet. The former will yield a large supply of peat, and the latter when drained will be available as farming land in the areas in which the soil is suitable. That draining such areas is a possibility is shown by the fact that creeks have been observed to have

their origin within them. They are therefore above the level of the rivers. The readings of the aneroid barometer would lead one to the same conclusion. The soil underlying the muskegs is in most cases a heavy bluish white clay, (specimen No. 7) and is of very doubtful value for the production of crops. In its present condition much of it would be suitable for brick-making.

II. Overland Excursions

Township South of Jessop

The Mattagami river was descended to a point one mile below Niven's base line of 1899. Leaving the river at this point I went north, reaching the Mattagami again, on the northern side of the Big Bend, at the middle one of the three Sandy portages. According to calculation by the use of a tally register to count the paces, this distance is four miles and forty-six chains, of which the following is a description:

Mile 1: Poplar, averaging twelve inches in diameter; spruce, ten inches; balsam; balm of Gilead, ten inches; dead tamarac, ten inches. Soil, clay loam to thirty-six chains. Spruce, eight inches; some white birch. Soil, clay loam, to eighty chains.

Mile 2: Same, with some poplar, averaging fifteen inches, to sixty chains. Dead tamarac, twelve inches; spruce, ten inches, to seventy-two chains. Small lake from seventy-two to eighty chains in centre of marsh, surrounded by black spruce forest.

Mile 3: Dead tamarac, spruce and some poplar. Soil, clay loam.

Mile 4: Same to fifty chains. Poplar, fifteen inches; spruce, black and white, twelve inches; tamarac, birch, to eighty chains.

Mile 5: Same to river at forty-six chains.

Niven's Base Line of 1899

This line was reached at mile eighteen and twenty chains (hereafter written M. 18, 20c.), by the Water Hen portage. A poplar and spruce forest with clay soil extends west along this line to M. 19, 65c. In this locality the character of the country changes and the line to M. 25 runs through sandy and rocky country, wooded with small spruce, Banksian pine, small poplar and birch.

The country for two miles north of M. 25 was found to be rocky or sandy and wooded with black spruce, seven inches, and jack-pine, eight inches. Continuing the trip two miles east and then two miles south to the line, very similar country was observed.

Mattagami River to Kamiskotaia Lake

On ascending Coffey (or Kamiskotaia) river, which is about one chain wide at its mouth, one observes that its banks are about forty feet high, of the usual clay nature, and wooded with poplar, twelve inches, black and white spruce, ten inches, balm of Gilead, white birch and balsam. After paddling one-half mile the first portage is reached, twenty-four chains long, which extends for two-thirds of the distance through a poplar and spruce forest growing on a clay soil, and for the middle one-third over a jack-pine ridge of sandy soil. The second portage, eight chains in length, is over a jack-pine ridge, but the third one, forty-five chains long, is over rolling clay and sand, wooded with spruce, ten inches, balsam and poplar. The last five chains of this portage lead one over an outcrop of rock sparsely wooded with dwarf black spruce. The next portage, forty chains in length, is over clay loam land, wooded with young poplar, eight inches, and

spruce, four inches. The small creek which one now paddles down to Kamiskotaia lake has low banks with an alder border, behind which is a black spruce forest growing on a clay soil.

Kamiskotaia Lake

A portage extends from Kamiskotaia to a smaller lake about a mile and forty-five chains north of the former. For the first twenty chains this portage runs over sandy loam or loam (specimen No. 4, Martin's garden soil), wooded with poplar, ten inches, some white spruce, sixteen inches, balsam, black spruce and dead tamarac. The next mile is over a jack-pine plain, having trees six to eight inches in diameter growing on a very fine white sand. The rest of this distance to the small lake is through very wet country timbered with six-inch black spruce, some poplar and balm of Gilead, twelve inches, cedar, balsam, and dead tamarac.

The shores of the small lake are low, and wooded mostly with black spruce and dead tamarac, though there are some poplar and balm of Gilead on the northern shore.

Continuing north from the northeast corner of this lake, one passes through rolling sandy country wooded mostly with jack-pine, eleven inches in diameter, and some birch, small poplar, and black spruce, nine inches, and after having travelled fifty chains a river is observed one chain wide, flowing southeast. Its banks are at the point crossed about thirty feet high, sandy and wooded with jack-pine and black spruce, and an occasional white spruce, sixteen inches in diameter. The country for a mile and a half or more north of this point has sand, sand loam or loam soil, (soil specimen No. 3), is broken by several ravines from one hundred to two hundred feet deep, and is forested by jack-pine and associated trees. Much of it, however, was overrun by fire only two or three years ago, and the timber largely destroyed.

For three miles west of lake Kamiskotaia, the country is mostly rocky and sandy. The general surface is rolling, though here and there a rocky hill occurs. The forest growth consists largely of black spruce, seven inches, and some birch, jack-pine, and poplar of ordinary size.

Kidd Township

Kidd township was entered by travelling east from a point on the Mattagami river about five miles below the mouth of Coffey river. At this point the river bank is forty feet high, has clay loam soil and is wooded like much of the banks of the Mattagami, *i. e.*, with poplar, twelve to fifteen inches, scattered white spruce, fifteen inches, balm of Gilead, balsam, and along the margin of the river, some fair cedar, sixteen inches. This timber extends east twenty chains. Then to fifteen chains on the second mile one passes through a black spruce forest of seven-inch trees, growing on a clay subsoil overlaid with twelve inches of moss and black muck. The balance of this mile extends through a brulé two or three years of age, many blackened stumps of black spruce and tamarac, five or six inches, still standing. The black spruce forest of trees, seven inches, extends to the end of the fourth mile. Now turning south, one passes through the same sort of forest for sixty chains, and then one enters a very wet country deeply covered with sphagnum and sparsely wooded with dwarf spruce and tamarac, almost a muskeg, in fact. This extends to thirty-five chains on the second mile south, and then passes gradually into black spruce forest again, which continues to the end of the mile. Returning to the river, one passes through an almost unbroken black spruce forest of trees six to seven inches in diameter until within twenty-six chains of the Mattagami, when the usual well drained river bank clay loam soil with its characteristic timber appears.

Macdiarmid Township

On going west from the Mattagami one mile south of the north boundary of this township, the river timber is found to extend inland fifteen chains. For the balance of two miles one observes a black spruce forest of trees five to six inches in diameter. Now turning southeast, similar country is passed through for two miles, at the end of which a poplar area is entered. This is found to extend south forty chains, and then east one mile to the river. The soil is nearly all clay loam.

Carnegie Township

A trail directed east and west about sixty chains south of the north boundary of Carnegie township was followed and used as a base line for trips into Carnegie and Crawford townships. The river-bank timber extends inland along this trail for twenty chains, and then wet spruce forest of seven-inch trees and an occasional small poplar knoll occupy the remainder of five miles of the trail.

An excursion to the south of this trail beginning two miles from the eastern boundary of the township showed an area of well-drained rolling clay land, wooded with spruce, fifteen inches, (some white spruce even twenty-four inches in diameter), balm of Gilead and poplar, twelve inches, cedar, fifteen inches, balsam and some birch. This area extends south of the trail for nearly three miles, and will make good farms. Turning west, wet spruce forest of seven-inch trees was observed to extend for two and one-half miles. Similar spruce forest and an occasional small poplar knoll was seen on the return trip north to the trail.

Mahaffy and Crawford Township

An excursion was made into these townships one mile from their northern boundary, starting from the Mattagami river and continuing east four miles. The return trip to the river was made over the same route.

The usual types of country were observed, with spruce forest present in a larger proportion than is commonly the case. Most of this spruce forest, of which the trees average six inches, is dry, and the clay subsoil (very similar to soil specimen No. 22), is covered by only a few inches of organic matter, two features in which it contrasts sharply with most of the spruce forest of the region traversed.

On travelling north from the trail spoken of in the description of the excursion into Carnegie township, at a point one mile and sixty chains east of the Mattagami, wet spruce and tamarac forest is observed, and in sixty-four chains one comes to the southern boundary of Crawford township. Continuing as follows two miles north, two miles east, then south to the trail, much of this corner of the township was found to be muskeg.

Aubin, Nesbitt, Kingsmill

An excursion was made into the two former townships about two miles south of their northern boundary. The river-bank timber, poplar, ten to twelve inches, spruce, eight to ten inches, balsam and occasional birch, extends inland twenty chains in this locality. Farther inland for six miles and twenty chains, a very large proportion of the country through which the excursion was made is a spruce forest of rather unusual character The trees average only five or six inches in diameter and the soil is a dry heavy clay (soil specimen No. 22), covered by only a few inches of organic matter.

Extending from sixty chains on mile four from the river for about one mile east, there is a large muskeg, at least two miles long from north to south. It is nine feet deep.

An excursion into Aubin and the township west of Aubin, Kingsmill, was made as follows: west from the Mattagami river to Speight's meridian, which was intersected at M. 8, 40c.; south on the meridian to M. 9, 40c.; west four miles and return.

The large poplar and clay soil of the river bank at this point extend inland for thirty-six chains. The remainder of the excursion was through country of the usual alternation of spruce forest, poplar knoll and muskeg. The trees of the spruce forest average from five to six inches, and grow on a hard dry clay soil very similar to soil specimen No. 22.

Township of Dargavel

This township was entered from the middle point of its northern boundary. Proceeding south, one passes through a wet spruce forest of six-inch trees. Towards the end of the third mile and continuing for sixty chains into the next, the forest is drier and some poplars occur. Turning east, one finds dry spruce forest of eight-inch trees, with some birch and poplar for one mile. The next mile, however, is very wet, and the first twenty-four chains and the last ten are muskeg with six feet of peat. Now returning to the northern boundary a rolling clay loam country is found, well drained, and wooded with black and white spruce, ten inches, birch, ten inches, poplar, twelve inches, and balsam. The good trees, however, are scattered on account of the very large number of windfalls.

Township of Lennox

On going south for three miles from the middle point of the northern boundary of this township, one passes over dry rolling clay loam land, wooded with a thicket of young poplar and spruce about forty years old. Soil specimen No. 9 was taken from this locality. For the next halt mile one observes wet spruce thicket. On turning west similar country is found for two and one-quarter miles. Then succeeds a wet spruce forest of seven-inch trees for twenty chains, which one finds on travelling north to extend to the northern boundary of the township.

Latitude of Milepost 162 Niven's Line

The base line in latitude of mile-post 162 of Niven's line was followed east from the Mattagami river for eight and one-half miles, and trips to the north and south of it were made as described below.

The Mattagami, where the line crosses it, has rather low banks wooded with spruce, six inches, poplar, ten inches, balsam and occasional birch. In three chains this very poor type of river bank timber gives place to black spruce, six to seven inches, growing on clay soil, for the most part wet. With the following breaks this spruce forest extends to mile-post 10: (1) From ten chains west to twenty chains east of mile-post 10 a poplar knoll, from which soil specimen No. 8 was taken; (2) from mile-post 9 to twenty chains east of it, another poplar knoll; (3) from sixty chains west of mile-post 6 to twenty chains east of it, muskeg with six feet of peat; (4) about the middle of mile 5 Driftwood creek, eighty feet wide, with a few chains of river bank timber on either side.

Sydere Township

Turning north about the middle of the eleventh mile west of Speight's meridian (1905) on this line, the traveller passes successively through wet spruce forest for one mile and twenty-four chains; poplar knoll for forty chains; spruce forest for ten chains; poplar knoll having a rolling surface and soil much like soil specimen No. 10, for

sixty chains; spruce forest of six-inch trees for ten chains; muskeg, having seven feet of peat resting on a hard bottom of bluish white clay for forty chains. Toward the east this muskeg extends tweny chains. Continuing east for three miles, poplar woods and spruce forest in about equal proportions were observed. Returning south to the line similar country was seen, also having a good proportion of poplar woods. The western branch of the Muskego, forty-five feet wide and having the usual river-bank white spruce of twelve to sixteen inches in diameter, was crossed about one and one-half miles north of the line.

East Part Bradburn Township

Information concerning this township was obtained by an overland trip made west of Loon portage on the Mattagami river. After travelling for forty chains through a poplar, spruce and birch forest of small trees followed by a ten-inch spruce forest for ten chains, the eastern boundary of this township is reached at a point one mile and forty chains from its southern extremity. From this point north for forty chains, one observes a spruce and poplar forest growing on clay loam soil. Turning west a rolling clay loam country is traversed, wooded fairly well with poplar and balm of Gilead, fourteen inches, white spruce, twelve inches, and balsam. The eastern branch of the Muskego river was crossed about two miles and twenty chains west of the eastern boundary. It is here about forty feet wide, and has clay banks ten feet high, on which grow some fine white spruce. Towards the end of the third mile, the soil becomes sandy and the timber somewhat smaller. This condition does not extend far, however, and on turning south one passes through excellent country, similar to that described between the eastern boundary and the Muskego river, until the southern boundary is reached.

A trip made through the township lying south of Sydere may be outlined as follows: southwest from M. 8, 40c. on the north boundary, one mile; then successively west two miles, south four miles, northeast one mile, east three miles, north to northern boundary, about four miles. Approximately fifty per cent. of this excursion was through spruce forest, thirty per cent. through poplar woods, and twenty per cent. over muskegs.

Between Mattagami and Muskego

Two and one-half miles west of the Mattagami the Muskego river (here about forty feet wide) crosses this line. Between these two rivers there is a well drained area of clay and clay loam soil, wooded with poplar, fifteen inches, black and white spruce, ten inches, balsam and dead tamarac. This continues a mile west of the Muskego. Then the country becomes wetter, with more spruce and less poplar, but at sixty chains on M. 5 of the line it becomes drier again and wooded with birch, poplar and spruce growing on a coarse sand. Sandy soil continues about one mile, (soil specimen No. 10). West to M. 8, 40c. the country is fairly well drained, and is wooded with spruce, seven inches, poplar, twelve inches and some birch. The soil is mostly clay, though there is an occasional low ridge of sand, running north and south. For two miles west of this point, the country is a wet spruce forest of six to seven-inch trees, with here and there a small poplar knoll and an occasional small area of muskeg.

West in Latitude of Milepost 174 Niven's Line

At the point where this line crosses it, the Mattagami river has banks about forty feet high. Their soil is clay loam and their forest growth consists of poplar, twelve to fifteen inches, spruce, ten inches, balsam and white birch, ten inches. This description would apply generally to the banks of the Mattagami in the region explored. Their slope varies very much, but they are usually rather steep.

The river-bank soil (specimens Nos. 12 and 13) and timber extend westward from the Mattagami for twenty chains beyond the Muskego river, which crosses the line two miles from the Mattagami. Farther west, the line runs through wet spruce forest with here and there a poplar knoll. At the time of making this trip the line was cut only to M. 18, 30c.

The Muskego river is formed by two branches which unite about six miles south of the line. From the point of junction a trip was made three miles west, then north and east until the line was reached quite near the Muskego. This excursion was through the usual alternation of six to seven-inch forest, poplar knoll and muskeg, the poplar knoll being present in somewhat greater and the muskeg in somewhat less proportion than is often the case.

An excursion from the line at M. 18, 10c. southwest four miles, east two miles, then northeast to the line again, showed very similar country.

Between the Mattagami and Muskego a short trip to the south of the line was made. It extended south for two miles and was mostly through poplar woods. Sand loam was observed in one or two localities on this trip, but the usual clay loam was the predominating soil, and was wooded with poplar, birch, balsam and spruce.

Round Lake Clement

Preceeding two and one-half miles in a northwesterly direction from M. 18, 30c. on this line, a country is passed through nearly altogether of the spruce forest type. For the next mile is rolling clay land well timbered with poplar, birch and balm, though there were very many fallen trees. Some fairly good cedar were seen on the last ten chains of this mile. This brought one to the shore of a lake, apparently about three miles long from north to south and fifteen chains wide from east to west. It was afterward learned that the line between M. 2, 72c. and M. 3, 7c. west of mile-post 18, crosses this lake. The Indian name not being ascertainable, it was called Clement lake. It appeared to be surrounded by a bank from twenty to forty feet high, wooded as already described. Having proceeded north along the sandy shore for sixty chains, the northern end of the lake was reached, and a river about one and one-half chains wide, Poplar Rapids river, was seen flowing out of the northeast angle of the lake.

Turning east, two miles of rolling country were traversed, mostly clay loam and loam, but in some places sandy, wooded with timber similar to that around Clement lake. Fallen trees are exceedingly numerous in this locality.

On travelling southeast and south to the line, the usual spruce forest with occasional islands of poplar woods was observed.

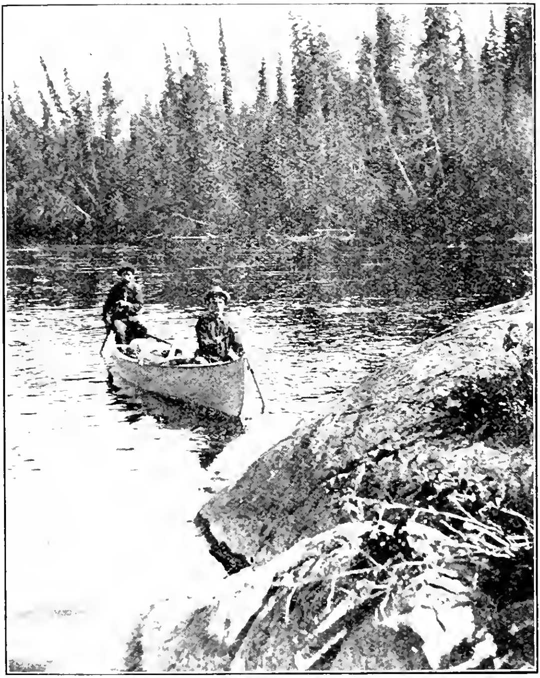
East in Latitude of Milepost 174 Niven's Line

The east bank of the Mattagami river where the base line in latitude of mile-post 174 on Niven's line crosses it, is about thirty-five feet high, its soil is sand and sand loam, and it is wooded with poplar, ten to twelve inches, spruce, eight inches, and balsam. Only fifteen chains inland, however, the soil is clay, and poplar averaging twelve to fifteen inches in diameter are common. The usual variation of poplar knoll, spruce forest and muskeg was observed along this line for fourteen miles. These are present in this distance roughly in the proportion of fifty, thirty-five and fifteen per cent., respectively, an unusually high percentage of poplar knoll.

Beginning thirty chains east of mile-post ten and extending east for eighteen chains, there is a dry clay area wooded with poplar, seven inches, spruce and tamarac, four to five inches—timber very similar to that observed on the base line twelve miles south of this one, and also on the excursion made between these base lines. Frequent areas of forest of the same age occur throughout the rest of the distance travelled on this line, indicating that this old brulé is of considerable extent.

Soil specimen No. 17 is taken from a small sandy knoll immediately east of mile-post 6. Light white sand occurs for about sixty chains east of mile-post 4.

Driftwood creek crosses the line on the third mile about fifteen miles west of the district boundary. It is here about two chains wide, and has clay loam banks thirty feet high, wooded with poplar and balm of Gilead, twelve to fifteen inches in diameter, black and white spruce, ten to twelve inches, and balsam, this timber extending for ten chains on the west side of the river and twenty chains on the east side.



Voyageurs on the Mattagami.

South of the Line

The meridian forming the eastern boundary of a block twelve miles square south of the above mentioned base line between mile-posts 1 and 12, including what is now the northern parts of Calder and Bradburn townships, was followed south from the northeast corner of the block (mile-post 42 on the meridian) to M. 34, 20c. Spruce forest, poplar knoll and muskeg are present in this distance approximately in the proportion of seventy-one, twenty-two and seven per cent. respectively. Some areas

of the old brulé, mentioned in the description of the northern boundary, occur along this line.

A granite hill, one hundred and fifty feet high, occurs on the fortieth mile. A good view of the surrounding country can ordinarily be obtained from the top of this hill. Unfortunately the view was obscured by mists and clouds on the day on which it was ascended. However to the south and west, as far as could be seen, eight or ten miles, the country presented a gently undulating surface with a covering of spruce forest and poplar woods, the latter present in somewhat smaller proportion than the former.

Soil specimens No. 18 and No. 19 were obtained from the floor of the spruce forest at M. 35, 60c.

After having travelled about six miles a few degrees to the south of west from M. 34, 20c., on the meridian, Driftwood creek was reached at a point a few chains north of the portage between this creek and the Mattagami river. This line of march led through a brulé of similar age to that described elsewhere as occurring on the northern, southern and eastern boundaries of this block. An unusually large proportion of the brulé in this locality is fairly well-drained clay land, wooded with small poplar spruce and tamarac. West of the Driftwood, the poplar brulé continues for one mile. It is also found to extend for the two miles of the portage immediately east of the Mattagami. The intervening portion of the portage leads for the most part through wet spruce country.

In this region a trip was made beginning at Davis rapids on the Mattagami river and extending one mile east, then north and west to the western boundary which was intercepted at M. 4, 40c. The trip thus far revealed fairly dry country, mostly brulé, wooded with small spruce and tamarac, with occasional clusters of small poplar. From M. 4, 40c. to M. 8 spruce forest was observed, with two small areas of muskeg. Extending east of M. 8, and then northwest to the northern boundary, the common alternation of spruce forest, poplar knoll and muskeg was noted.

East from Jump-over Falls

The river bank at this point is fifty feet high, its soil is clay loam, and it is wooded with spruce and birch, ten inches, poplar, ten to twelve inches, and balsam. This combination of soil and timber extends inland for two and one-half miles, with the exception that in occasional small areas the soil is loam or sand loam. Farther east sphagnous spruce forest of seven-inch trees extends for one and one-half miles. North of the farthest point east there is similar country for one mile and sixty chains, following which is an area of well-drained clay loam soil wooded with spruce, ten inches (some large white spruce, sixteen inches in diameter), poplar and balm of Gilead, twelve to fifteen inches. There are very many fallen trees in this locality. Between this area and the Mattagami there is spruce forest of six or seven-inch trees, mostly fairly well drained and the usual river-bank country, which extends inland at this point for thirty chains.

West of Mattagami River, below Jump-over Falls

The river-bank timber extends inland at the starting point of this trip for thirty chains . The remainder of the excursion, three miles and fifty chains west, two miles south, and finally east to the river, revealed dry spruce forest with occasional poplar knolls and small muskegs, the general surface being undulating rather than flat as is so commonly the case.

An excursion west of the Mattagami river was made about the latitude of mile-post 186 on Niven's line. The outline of this excursion is as follows: five miles west, two miles north, east to the river. The whole trip was through a country of the usual types of area present in the usual proportions.

Another trip was made east of the river for about eight miles in latitude of mile-post 183, and south to the base line in latitude of mile post 174 on Niven's line. The river-bank timber extends inland only twelve chains in this locality. From this point to the end of the excursion at M. 7, 70c. on the base line in the latitude of mile-post 174 on Niven's line, there is an almost unbroken wet spruce forest of trees somewhat smaller than usual. In this large area there are very few poplar knolls. The surface of the country seen on this excursion is exceedingly flat

III.—Climate

The climate of the Clay Belt of northern Ontario has been described in general in a former report, so that little need here be said. However, it is advisable to call attention to the fact that the summer of 1905 was considerably warmer than that of 1904. The only serious frost recorded was 28.5° on August 27, whereas in the summer of 1904 there was a frost of similar severity during each of the summer months. In this connection it might be well to state that on August 17, in a wet spruce forest, ice was found eighteen inches beneath the surface of the moss. Undoubtedly ice is perpetual in such localities, and is probably the main factor in the production of the summer frosts. It may logically be argued, therefore, that clearing away and draining the wet spruce forests would tend to prevent summer frosts by eliminating the conditions favorable to the preservation of ice throughout the summer.

The following is a record of the daily minimum and maximum temperatures, the former registered on a minimum thermometer, and the latter on an ordinary thermometer about half past one o'clock. The records for September were made by Mr. H. L. Kerr, B.A., but for the sake of completeness are incorporated in this report Some "weather notes" are also given.

JUNE, 1905.

Date.	Minimum.	Maximum.	Notes.
14	53	80	Clear.
15	54	81	Clear.
6	56	78	Cloudy.
17	51	70	Cloudy at intervals.
18	54	85	Clear.
19	51	82	Clear. Strong S W wind
20	43	70.5	Clear.
21	43	75	Clear.
22	42	63	Clear
23	34	76	Clear.
24	44	76	Shower about 4.30 p.m.
25	54	57	Cloudy. W. to N W wind.
26	38	60	Clear.
27	43	67	Mostly clear
28	33.5	68	Clear.
29	38	77	Rain at night with N.W. gale.
30	53	75	Thunder shower about 2 p.m., with strong W. wind
Mean	46.15	72.97	

JULY, 1905.

Date	Minimum.	Maximum.	Notes.
1	54	73.5	Showery at night.
2	48.5	76	Clear.
3	50	86	Clear. Strong S. wind.
4	59	70	Cloudy and showery.
5	61.5	67.5	Cloudy and showery.
6	54	73.5	Mostly clear. Strong S.W. wind
7	56	78	Cloudy. Rain 3 to 7 p.m.
8	49	67	Cloudy until 3 p.m
9	49	70	Clear.
10	39.5	76	Clear.
11	39	80	Clear. S.W. breeze.
12	55	80	Rain in morning. Thunder shower at 7.30 p.m.
13	51.5	77	Thunder showers at 1.30 and 4 p.m., otherwise clear.
14	48	66	Clear. Rain at night.
15	30.5	64	Clear.
16	51.5	67	Raining most of day.
17	49	81	Clear. S.W. wind.
18	53.5	75	Mostly clear. Shower at noon.
19	56.5	61	Dull. A shower about 4 p.m.
20	35	68	Clear.
21	34	69	Clear.
22	52	67	Rain in a.m., clear in p.m. S. wind.
23	53	60	Rain most of day. Strong E. wind.
24	51	53	Rain most of day. Strong E. wind
25	39	62.5	Clear.
26	48	58	Showery.
27	36.5	70	Clear. Shower at 8 p.m. W. wind.
28	49.5	56	Cloudy and drizzling until 5 p.m.
29	38	68.5	Clear.
30	45	77	Clear. Shower at 8 p.m. Strong W. to N.W. wind.
31	36	55	Clear. Strong W. to N.W. wind.
Mean	47.58	69.43	

AUGUST, 1905.

Date.	Minimum.	Maximum.	Notes.
1	30	67	Clear
2	34	72.5	Clear W. breeze
3	47	74	Clear. Shower at 7 p.m. W. breeze
4	48.5	74	Cloudy at intervals
5	48	63	Raining all day.
6	51	52	Cloudy with occasional showers.
7	34.5	61	Showery until 4 p.m.
8	34	68	Clear S. to S.W. breeze.
9	42	59	Cloudy Rain at night
10	52	69.5	Cloudy in p.m.
11	48	72.5	Cloudy until 11 a.m. Shower at night.
12	56.5	63	Clear.
13	34	60	Clear.
14	36	64	Clear S.W. breeze.
15	39	66	Cloudy in p.m.
16	48	70	Clear.
17	37	70	Cloudy in p.m.
18	52	63.5	Cloudy. Rain after 4 p.m.
19	56.5	64	Cloudy. Rain after 4 p.m
20	52	70	Clear. Strong S. to S.W. wind.
21	51	72	Mostly clear. Showery at intervals. S. to S.W. breeze.
22	49	65	Mostly clear. Showery at intervals S. to S.W. breeze.
23	41.5	70	Clear. Strong S.W. to S. wind
24	33.5	66	Clear.
25	39.5	68.5	Clear.
26	43.5	65	Clear.
27	28.5	73	Clear.
28	52	67.5	Clear.
29	45	72	Rain after 3 p.m.
30		64	Cloudy and drizzling all day
31	46	55	Cloudy. N. to N.E. breeze.
Mean	43.65	66.48	

SEPTEMBER, 1905

Date	Minimum	Maximum	Notes
1	40	64	Cloudy and rain in a.m. Clear in p.m.
2	33	63.5	Clear in a.m. Cloudy in p.m.
3	46	58	Rain in a.m.
4	51	58	Cloudy. Rain at 4 p.m.
5	50	62	Cloudy. Rain at night.
6	44	69	Rained heavily during night.
7	52	69	Rainy all day.
8	41	68	Mostly fine.
9	40	65.5	Clear.
10	51.75	70	Rain in early morning.
11	50	73	
12	56	58	Rain in p.m.
13	27	65	Clear.
14	58	56	Clear.
15	52	57	Raining all day.
16	48	69	Rain in a.m. Clear in p.m.
17	48	62	Cloudy.
18	43	70	Clear
19	55.5	73.5	Rain in evening. Strong S. wind.
20	45	58	
21	46	56	Thunder storm at noon.
22	48	56	Clear in a.m. Some hail about 1 p.m. with rain and strong S.W. wind.
23	39.5	51	High wind veering to N.W.
24	27.5	50	Rain in a.m.
25	35	43	Cloudy. Snow flurries in a.m.
26	23	45	Cloudy in p.m.
27	39	64	Clear in p.m.
28	43	64.5	Clear after 10 a.m.
29	44	76.5	Clear.
30	41	77.5	Clear.
Mean	44.00	62.23	

For the sake of comparing the temperature of the Clay Belt with that of an agricultural district of southern Ontario, the following table is given of the mean daily minimum and maximum temperatures in the Clay Belt and at the Ontario Agricultural College, Guelph. The latter figures were kindly supplied by Professor Reynolds, of that institution.

Temperatures of Clay Belt and Guelph

Month	Region	Mean daily maximum	Mean daily minimum
June	Clay Belt Guelph	72.97 73.2	[illegible] [illegible]
July	Clay Belt Guelph	59.4[illegible] 76.7	47.58 58.6
August	Clay Belt Guelph	66.48 76.8	43.65 55.7
September	Clay Belt Guelph	62.23 73.4	44.00 49.3

IV. Flora and Fauna

Flora

The following is a list of the names of plants identified in the Mattagami valley during the summer of 1905. Only "spare" moments were given to this work, and the list is therefore very incomplete, and very similar to that reported for the summer

of 1904. As in 1904, Gray's Manual of Botany was used in the preparation of this list, which is given just as additions were made to it from time to time in the field. In most cases, the accompanying date is approximately the first date of flowering.

Flowering Plants

Prunus Pennsylvanica	June	7
" Virginiana	"	7
Alnus viride	"	7
Myrica asplenifolia	"	7
Viola blanda	"	7
" canina	"	7
Cornus Canadense	"	7
Gaylussacia resinosa	"	7
Vaccinium Pennsylvanicum	"	7
Polygala paucifolia	"	7
Kalmia glauca	"	7
Andromeda polifolia	"	7
Maianthemum Canadense	"	7
Viola canina, var. Muhlenberger	"	8
Coptis trifolia	"	8
Trientalis Americana	"	10
Fragaria Virginiana	"	10
Cornus paniculata	"	12
Streptopus roseus	"	12
Clintonia borealis	"	12
Actaea spicata, var. rubra	"	12
Rubus triflorus	"	14
Aralia nudicaulis	"	14
Trillium cernuum	"	14
Mertensia paniculata	"	17
Clematis verticillaris	"	17
Sambucus racemosa	"	17
Acer spicatum	"	17
Ledum latifolium	"	17
Pyrola rotundifolia, var. incarnata	"	17
Viola palmata, var. cucullata	"	17
Cornus stolonifera	"	17
Menyanthes trifoliata	"	17
Amelanchier Canadensis	"	17
Caltha palustris	"	17
Viburnum Opulus	"	17
Mitella nuda	"	17
Anemone Pennsylvanica	"	17
Rosa sayi (?)	"	17
Ranunculus Flammula, var. reptans	"	17
Rosa blanda	"	17
Plantago major	"	17
Ranunculus abortivus	"	19
Geranium Carolinianum	"	19
Geum rivale	"	19
Taraxacum officinale	"	20
Nasturtium officinale	"	20
Smilacina racemosa	"	20
Cypripedium acaule	"	20
Iris versi color	"	20
Nuphar advena	"	20
Lathyrus ochroleucus	"	21
Stellaria longifolia	"	21
Anemone nemorosa	"	21
Comandra livida	"	21
Cypripedium parviflorum	"	21
Corallorhiza innata	"	21
Listera cordata	"	21
Vaccinium Oxycoccus	"	21
Cypripedium pubescens	"	22
Linnaea borealis	June	23
Sarracenia purpurea	"	23
Smilacina trifolia	"	23
Ranunculus septentrionalis (?)	"	23
Arethusa bulbosa	"	32
Orchis rotundifolia	"	23
Gillenia trifoliata	"	23
Lilium Philadelphicum	"	26
Ranunculus hispidus	"	26
Erigeron Philadelphicus	"	26
Vicia Cracca	"	26
Pyrola chlorantha	"	26
Anaphalis margaritacea	"	26
Potentilla fruticosa	"	26
Thalictrum dioicum	"	26
Potentilla anserina	"	27
Veronica scutellata	"	27
Oxalis acetosella	"	28
Corydalis glauca	"	28
Polygonum cilinode	"	28
Polygonatum biflorum	"	29
Epilobium augustifolium	"	29
Lonicera involucrata	"	29
Apocynum Androsaemifolium	"	29
Diervilla trifida	"	29
Lonicera oblongifolia	"	30
Kalmia augustifolia	July	1
Potentilla Norvegica	"	2
Galium trifidum	"	2
Habenaria hyperborea	"	2
Habenaria obtusata	"	3
Galium triflorum	"	5
Hedysarum boreale	"	5
Lonicera hirsuta	"	5
Moneses grandiflora	"	6
Sisyrinchium augustifolium	"	6
Brunella vulgaris	"	6
Rubus chamaemorus	"	9
Pyrola minor	"	9
Lonicera caerulea	"	9
Tofieldia glutinosa	"	9
Habenaria psycodes	"	9
Physocarpus opulifolius	"	9
Lysimachia thrysiflora	"	10
Circaea Alpina	"	11
Habenaria orbiculata	"	14
Osmorrhiza brevistylis	"	15
Heracleum lanatum	"	15
Halenia deflexa	"	15
Aralia hispida	"	15
Pyrola secunda	"	16
Lonicera ciliata	"	16
Mimulus ringens	"	17
Scutellaria galericulata	"	17
Spiraea salicifolia	"	17
Pyrola elliptica	"	17
Ranunculus hispidus	"	17
Myriophyllum verticillaris	"	17
Lobelia Kalmii	"	18
Lathyrus palustris	"	18
Galium boreale	"	18
Sagittaria variabilis	"	18
Mentha Canadensis	"	18

Nasturtium palustre	July	18
Apocynum cannabinum	"	18
Asclepias incarnata	"	18
Hieracium Canadense	"	18
Scutellaria lateriflora	"	19
Eupatorium purpureum	"	19
Sanicula Marylandica	"	19
Achillaea millefolium	"	19
Sium cicutaefolium	"	19
Ranunculus affinis	"	19
Monotropa Hypopitys	"	21
Spiranthes Romanzoffiana	"	21
Goodyera repens	"	25
Monotropa uniflora	"	25
Epilobium lineare	"	25
Geum strictum	"	29
Galium trifidum, var. pusillum	"	29
Galium trifidum, var. latifolium	"	29
Campanula aparinoides	"	30
Chimaphila umbellata	"	30
Stachys palustris	"	31
Prenanthes racemosa	"	31
Erigeron strigosus	"	31
Potentilla tridentata	Aug.	1
Lactuca hirsuta	"	1
Epilobium glandulosum	"	2
Lycopus sinuatus	Aug.	4
Lysimachia stricta	"	5
Ranunculus aquatilis, var. trichophyllus	"	6
Chelone glabra	"	6
Rumex verticillata	"	6
Polygonum amphibium	"	7
Convolvulus sepium	"	7
Cnicus muticus.		
Rhamnus alnifolia.		
Epigaea repens.		
Parnassia palustris.		

Ferns

Osmunda regalis.
Osmunda cinnamomea, var. frondosa.
Botrychium Virginianum.
Pteris aquilina.
Onoclea sensibilis.
Asplenium thelypteroides.
Polypodium vulgare.
Cystopteris bulbifera.
Phegopteris Dryopteris.
Aspidium spinulosum, var. intermedium.

Fauna

The fauna of this region is that of the valleys of the Frederick House and Abitibi rivers. For details the reader is again referred to the Report of the Bureau of Mines, 1905.

The number of furs taken in trade from the Indians at Fort Mattagami during the year ending June, 1905, is stated by Mr. James Miller, Hudson Bay Company factor in charge of that post, to be slightly less than that of the previous year. During recent years there has been a marked decrease in the furs produced in this region.

V.—Soil Specimens Collected in the Region

1. Lost.

2. From bank of Water Hen creek. A rich alluvial soil on which grow luxuriantly alders, willows and many smaller plants. Soil along small creeks is often of this nature

3. From bank of creek three miles north of lake Kamiskotaia. A fine white or reddish powdery soil, common in the southwestern part of the region and one on which are often found large poplar, birch and jack-pine. In this locality are poplar, fifteen inches in diameter, birch and jack-pine, twelve inches.

4. Subsoil from Indian garden on lake Kamiskotaia. Very similar to No. 3. Fair potatoes, turnips and onions are grown in this garden with no cultivation.

5. Surface soil from the same garden, the result of a mixture of soil like No. 4 with forest mould.

6. Decaying peat, twenty inches deep, from spruce forest near margin of a muskeg. Above the twenty inches of peat-like material is a layer of eight inches of moss.

7. Heavy clay subsoil taken just below No. 6. Bluish white hard clay. This is the common subsoil of muskegs and wet spruce forests of small trees.

8. From vicinity of mile-post 10, Patten's base line run west from M. 162 on Niven's line. A layer of decaying forest mould, two inches deep, overlies the subsoil of which

this is a sample. The specimen was taken six inches below the surface. Young poplar, eight inches; spruce, seven inches; birch, six inches; balsam, five inches, are the common trees on this soil. This is a representative specimen of the soils of poplar knolls.

9. Taken two miles south of mile-post 3 on the same line. A reddish clay loam is common in this and other townships. Specimen taken three inches below the overlying covering of forest mould which is two inches thick. Small poplar and spruce are the forest trees in this locality. Another representative specimen of the soils of poplar knolls.

10. From vicinity of M. 5, 40c. on Speight's base line in latitude of mile-post 162 on Niven's line. This soil extends only about one-half mile from east to west, but was found one mile south of this line. Poplar, fifteen inches; black and white spruce, ten inches, (some white spruce, sixteen inches); white birch, twelve inches, and luxuriant small flora. One of the best kinds of the lighter soils occurring in the region.

11. From district east of Clement lake. Specimen, a clay loam subsoil, taken two inches beneath the two-inch covering of decaying vegetable matter. Large poplar, balm of Gilead, spruce, balsam and birch grow on this soil. A common soil and a representative one of such a forest.

12. From vicinity of M. 15 on Patten's base line in latitude of M. 174 on Niven's line. Specimen is taken two inches below the overlying five inches of decaying vegetable mould. Poplar and balm of Gilead, twelve to fifteen inches; spruce, eleven inches; balsam, eight inches; birch, ten inches, are the forest trees named in order of the most common. This is a common soil between the Mattagami and Muskego rivers, and in other parts of the region.

13. Same locality. Specimen taken from the surface covering of vegetable mould.

14. Taken a mile and sixty chains east of Jump-over falls. Specimen of subsoil, beneath two inches of vegetable mould. Spruce and birch, poplar and Balm of Gilead are common forest trees

15. From bank of Poplar Rapids river, five miles from its mouth. Specimen taken fifteen inches below the surface. The overlying layer of decaying vegetable mould is four inches thick. Spruce and birch, ten inches; balsam, five inches small poplar and balm of Gilead, six inches, are the common trees.

16. Clay from landslide on bank of Mattagami river, two miles above Niven's line of 1900. River bank here thirty-five feet high. Specimen taken about twelve feet above the water. A good representative of the clay soil so common in the region.

17. From vicinity of Mile-post 6, Patten's base line in latitude of M. 174 on Niven's line. Specimen taken just below the three-inch covering of vegetable matter. A reddish sand loam, though an uncommon soil; usually is wooded with spruce, twelve inches; poplar, twelve to fifteen inches; birch, twelve inches; balsam, small.

18. From vicinity of M. 35, 45c., on Patten's meridian of 1904. Specimen of subsoil taken fourteen inches below the top of the moss of a wet spruce forest. The moss itself is six inches deep under which is black muck for about ten inches, which gradually changes into the clay loam subsoil. The surrounding forest consists of black spruce averaging seven or eight inches in diameter.

19. Specimen taken about five inches above specimen 18. This and No. 18 are representative soils of the black spruce forest, and therefore are found in a very large proportion of the region.

20. Specimen from a potato patch on a bank, three chains wide, between the Mattagami river and a small lake near Patten's base line in the latitude of M. 162 on Niven's line. Not a common soil. Potato plants in blossom on August fourteenth, and tubers present, one to two inches in diameter. Poplar, ten to fifteen inches, and cedar, fifteen inches in diameter, are quite common on this bank.

21. Taken two miles east of Mattagami river, opposite M. 8 on Speight's meridian

1905. Specimen a subsoil taken four inches under the two-inch covering of vegetable mould. Poplar, ten inches; birch, ten inches; few spruce and balsam are present.

22. Taken six miles east of Mattagami river opposite M. 8 on Speight's meridian of 1905. A hard heavy clay subsoil taken under four inches of vegetable mould not well decayed. The forest growth on this soil is poor. Black spruce, six inches; poplar, eight inches. A ten-inch poplar had seventy-eight annual rings.

23. From eastern boundary of Mahaffy township, between concessions five and six. A reddish brown subsoil taken two inches below the six-inch covering of well-decayed vegetable matter. This specimen is from a well drained spruce forest of trees averaging six or seven inches in diameter.

24. From bank of Mattagami river one mile south of the northern boundary of Mahaffy township. The bank is here sixty to seventy feet high, and the specimen is taken one-half way up the slope, five inches below the five-inch covering of vegetable matter. Poplar, twelve inches; spruce, ten inches; balsam and occasional ten-inch birch are the trees of the locality. Much of the river-bank soil is of this nature.

Chemical Analysis of Soils

For the following table, showing the chemical constituents of a number of soil specimens, I am indebted to Prof. Harcourt, of the Agricultural College, Guelph.

PERCENTAGE OF CONSTITUENTS.

No. of soil.	Moisture. (H_2O)	Organic and Volatile.	Insoluble Residue.	Iron and Aluminium. (Fe_2O_3 & Al_2O_3)	Lime. (CaO)	Magnesia (MgO)	Phosphoric acid (P_2O_5)	Potash. (K_2O)	Humus	Nitrogen	Remarks.
6	12.14	74.46	4.26	0.85	2.92	trace	.305	.123	25.7	1.414	5.68% residue, undecayed wood.
7	.41	6.04	71.19	6.94	5.93	"	.295	.207	....	....	Quite highly carbonated
12	1.79	4.28	79.09	10.85	0.99	.293	.215	.577	....	0.49	
13	14.17	74.64	3.09	0.17	2.66	trace	.325	.111	19.05	1.827	14.7% residue, undecayed wood.
16	.88	16.26	51.47	8.85	15.13	"	.285	.475	....	.035	Very highly carbonated.
18	2.54	7.57	76.32	11.71	.34	"	.240	.32	....	.112	
19	6.36	19.75	58.49	12.27	1.35	"	.285	.451	12.4	.378	
22	2.02	4.2	82.35	9.01	.73	"	.225	.37	......	.042	
23	1.39	2.9	83.02	8.30	1.18	.485	.21	.356	.	.021	
24	2.86	4.54	77.30	10.88	.91	trace	.265	.699	....	.042	

NOTE:—Soils 6 and 13 are almost wholly decayed or partially decayed wood. They thus contain quite a large quantity of residue from the ½ m. m. sieve. The other soils have but very little residue from sifting, what is present being mainly quartz and feldspar particles. No. 19 contains quite a large amount of residue, which consists of hardened soil which does not break down under quite a vigorous rubbing in an agate mortar.

Prof. Harcourt subjoins these remarks:

"Samples No. 6 and 13 are evidently from swamp soils, or, at least, are soils composed largely of organic matter. Both are naturally rich in nitrogen, but comparatively poor in potash and phosphoric acid, but more especially in the potash. Soils No. 7 and 16 are very rich in lime, the latter one especially may be considered calcareous; in fact, all but No. 18 contain an abundance of lime for ordinary agricultural purposes. The percentage of phosphoric acid is very uniform throughout all the samples, while, as may be expected, the more aluminium there is present, the richer the soil is in potash. Potash and phosphoric acid are derived from the decomposed rock materials from which soils are formed; consequently, the amount present will depend upon the nature of the original rock material. The soils examined have, with the exception of 6 and 13, about as much of these two valuable fertilizer constituents as ordinary cultivated soils. The nitrogen content varies widely. Nos. 6 and 13 are scarcely decomposed far enough to produce profitable crops. No. 19 contains about the same amount of nitrogen as the richer farm lands throughout Ontario. The balance of the samples are taken from the subsoil, and consequently, as much nitrogen is not expected. However, nitrogen is a

constituent which is gathered by the plants which have grown on the soil, and in their decomposition have left it in the surface soil. This constituent is more within the control of the farmer than the ash constituents, and to that extent is less important in considering the value of the soils.

"Taking all together, I think it might be safely said that all these soils would be comparatively easy of cultivation and that they contain a sufficient quantity of fertilizing constituents to render them quite fertile."

Physical Analysis of Soils

Prof. Reynolds, of the Ontario Agricultural College, has been good enough to make a physical examination of the several samples of soil, the results of which are contained in the following schedule:

No.	Grade.	Sand group.	Clay group.	Coarse gravel.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand	Silt.	Clay.	Potash.	Lime.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	Loam	50.3	49 7	0.0	0.0	0.0	0 4	27.6	22.3	36 6	13.1	.....	.....
3	Loam	53.3	46.7	0.7	0.6	1.9	2.0	36.3	12.5	39.5	7.2	.....	.....
4	Loam	39 6	60.4	2.0	1.5	4.1	2.2	11.7	20 1	51.4	9.0	.....	.....
5	Loam	44.2	55 8	0.5	1.2	6.0	3.7	13.6	19.7	43.7	12.1	.....	.....
6	Peat	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 92
7	Heavy clay	6 3	93.7	0.0	0.0	0.1	1.6	0.6	4.0	85.0	8.7	0.21	5.93
8	Clay loam	29 7	70.3	1.4	3 7	3.2	3.2	11.9	7.7	70 3		.....	.....
9	Clay loam	25.1	74.9	0 0	1.0	2.5	2.8	9.3	9.5	45.0	29.9	.....	.....
10	Loam	60.1	39.9	0 0	9.0	15.2	15 0	11.8	9.1	25.1	14.8	.....	.....
11	Clay loam	29.5	70.5	0.0	0.0	0.0	1 6	8.5	19.4	41 9	28.6	.....	.....
12	Clay	12 0	88.0	0.3	0.0	0.6	1.1	6.7	3.6	39.2	48.8	0.58	0.99
13	Organic matter	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.66
14	Clay	20.4	79.6	0.0	1.5	3.2	1.7	7.2	6.8	33 6	46.0	.....	.....
15	Clay loam	27.1	72.9	0.0	0.0	0.5	0.8	8.8	17.0	72.9		.....	.....
16	Clay	16.2	83.8	0.3	1.6	1.4	1.5	4.6	7.1	43.5	40.3	0.48	15.13
17	Sandy loam	70.1	29.9	0.0	1.8	3.9	5.2	38 4	20 8	29.9		.....	.....
18	Clay loam	26.1	73.9	0.0	0.8	0.8	0.7	12.9	10 9	40.0	33.9	0.32	0.34
19	Clay	18.2	81 8	0 0	0 7	1.5	2.6	6.6	6.8	36.0	45.8	0.45	1.35
20	Light sandy loam	75.2	24.8	1.24	0.5	0.9	1.0	50.5	22.3	15.9	8.9	.....	.....
21	Clay loam	28.7	71.3	3.0	1.6	3.0	3.0	9.2	11.9	51.6	19.7	.....	.....
22	Heavy clay	3.9	96.1	0 0	0.0	0.0	0.0	1.6	2.3	49.0	47.1	0.37	0.73
23	Clay	14.4	85.6	1.0	1.0	2.4	1.5	4.3	5.2	57.3	28.3	0.36	1.18
24	Clay	17.7	82.3	0.6	1.4	1.9	2.2	6.7	5.5	32.3	50.0	0.70	0.91

In further elucidation of this table. Prof. Reynolds says:

"Of the twenty-one mineral soils analysed, 43 per cent. are clays and heavy clays. Of these Nos. 12, 14, 19, and 24 have a relatively high percentage of clay proper, that is, of very fine soil particles composed principally of feldspar. Nos. 7, 9 and 23 have a relatively high percentage of silt. Silt consists of particles coarser than clay, but still very fine, and is composed principally of quartz rock. Nos. 16 and 22 have nearly equal proportions of silt and clay. These numbers are the clays and heavy clays. The clay loams are Nos. 8, 11, 15, 18, and 21. The average percentage of sand in these is 28.2. Tho loams are Nos. 2, 3, 4, 5, and 10, the average percentage of sand in them being 49.5 per cent. There are two sandy soils, Nos. 17 and 20, with an average per cent. of sand of 72.6.

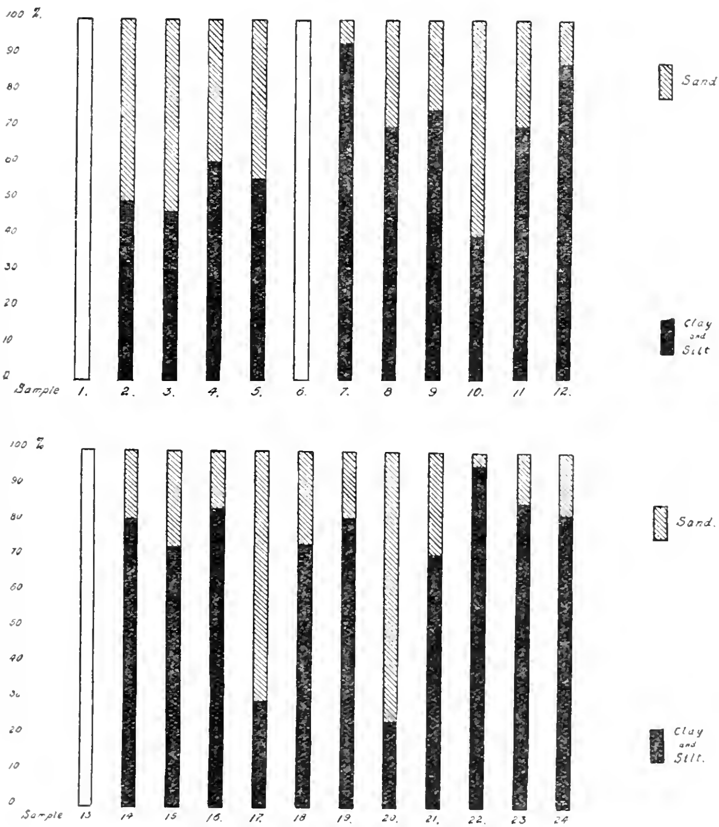
"Upon comparing my analyses with those made by Prof. Harcourt in the Chemical department, I observe that almost without exception soils that are high in clay are also high in potash, and vice versa. Soil No. 24 has 50 per cent of clay, and the potash content of this soil is .70 per cent.; No. 12 has 49 per cent. clay, and .58 potash; No. 19, 46 per cent. clay and .45 potash; No. 23 has 28 per cent. clay, and .21 per cent. potash. This comparison establishes in an interestiug way the fact of the strength of clay soils as compared with soils deficient in clay, an since most of these northern soils are distinctly clayey in type, it may be inferred that they are well provided with potash.

"Another feature quite observable in the physical character of these soils is their large content of lime,—they are highly calcareous. The physical result of the lime content is the friability which they possess in a degree very marked when we consider that they are clay soils.

"A number of these soils have the appearance of cultivated soils with a good proportion of humus and in a good mechanical condition. It would, however, be erroneous to judge the value of these soils from their content of vegetable matter, since many of them are subsoils, but, taken altogether, they seem to me to be good agricultural soils."

A chart showing graphically the proportion of clay and silt, on the one hand, and of sand on the other, in the several samples of soil was prepared by Prof. Reynolds, and is herewith reproduced:

Mattagami Soils



THE ANIMIKIE IRON RANGE

BY L P SILVER, B.Sc., A.M.

After having spent the month of May, 1905, in the Cobalt area assisting Prof. W. G. Miller, Provincial Geologist, the writer was instructed to proceed to Port Arthur and examine the Animikie iron range from Loon lake to Port Arthur, a distance of 30 miles. Mr. W. N. Smith of Wisconsin University had mapped the area the preceding year from Pearl River to Beck siding in great detail, so that the writer had to make but few minor additions to that part of the map. Mr. Smith's excellent summary of the region was printed in the Fourteenth Report of the Bureau of Mines, pages 254 to 260.

Mr. W. A. Begg was my assistant in the field, and he proved himself a very capable and untiring worker. The work was carried out under the direction of the Provincial Geologist, who spent a few days in the field at the close of the season, and to his valuable suggestions any credit due this paper belongs.

The country mapped consists mainly of old lake beaches, some of which are 400 feet above the present level of Superior; the surface therefore is composed of sand and gravel terraces. The vegetation which covered these has been burned over, obliterating all the township lines, so that it was found advisable to use the Canadian Pacific Railway track as a base line, and as every mile is numbered, it served the purpose excellently.

Traverses were made to the north and south limits of the map sheet at every alternate mile along the division, one day's operations consisting of a traverse north from some point on the railway to the northern limit of the sheet, thence travelling westward for a mile, returning due south to the track. The next day the corresponding rectangle to the south of the track would be covered; and the next mile being omitted, the operation would be repeated. In this way no point in the map could be more than half a mile distant from territory which was actually gone over.

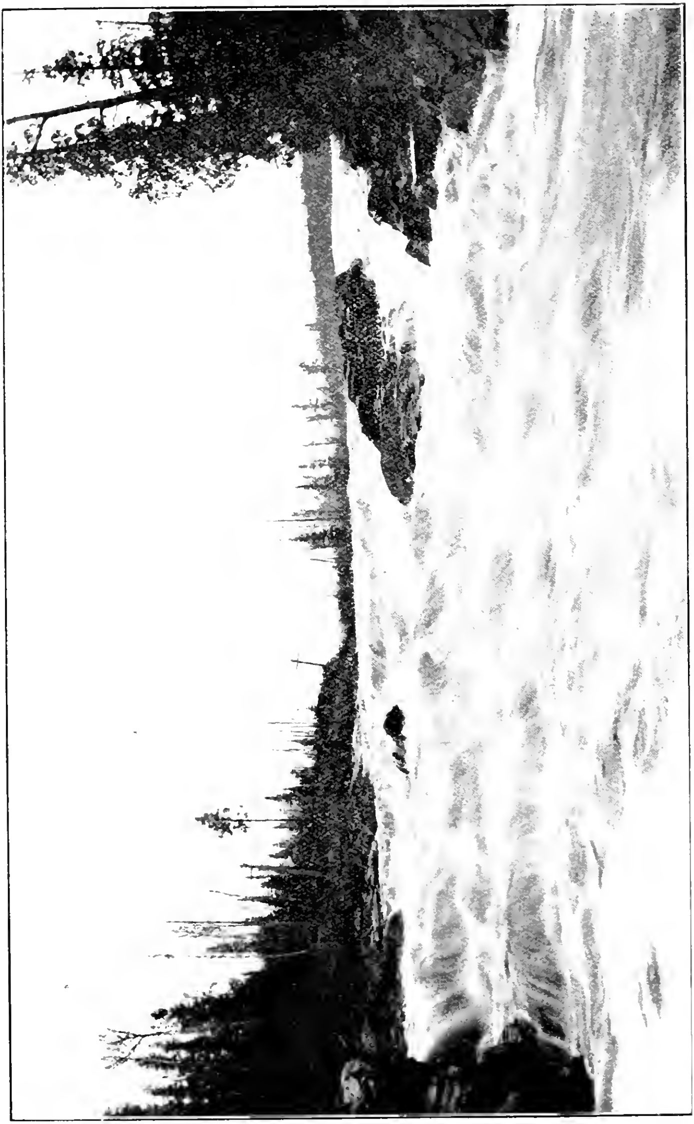
The Animikie iron-bearing series, which is the eastward extension of the Mesabi or Upper Huronian series of Minnesota, is best developed east of Port Arthur, where considerable exploratory work has been done. This area came into prominence about 40 years ago as the result of explorations for silver ore, a large quantity of which was mined from Silver islet in lake Superior, and from other mines on the mainland at Rabbit mountain and elsewhere. The iron deposits were early recognized as of probably commercial value, but the little prospecting then done was not attended with success. Within the last few years some very systematic work has been done in the region both in test pitting and diamond drilling by Mr. Rinaldo McConnell of Ottawa, Messrs. Wiley Bros. and Marks, Mr. T. Hogan, and Messrs. Flaherty and Knobell of Port Arthur, and to these gentlemen the writer is indebted for the opportunity of examining the properties.

As the Canadian Pacific railway passes right over the iron lands, the facilities for shipping the ore to the smelter now in course of construction at Port Arthur are very favorable.

Geology

Conforming with the classification recommended by the International Committee on the Pre-Cambrian geology,[1] all the rocks save the Pleistocene, and possibly the Logan

[1] Bur. Min., 14th Report, 1904.



Current river in spring.

Sills are regarded as of pre-Cambrian age. We have no means of determining the age of the Logan Sills, as they are evidently later than the Keweenawan, but how much later it is impossible to state.

The succession is as follows in descending order:

Pleistocene: Glacial drift, residual clays, beach sands and gravel.
(Unconformity).

Logan Sills: Diabase, diorite or gabbro intruding all the following formations.
(Igneous contact).

Keweenawan, (Nipigon):—Conglomerate, sandstone, impure marls.
(Unconformity).

Upper Huronian, (Animikie):—Iron bearing formation, black slates, impure limestones and quartz conglomerate.
(Unconformity).

Middle Huronian granite. (Igneous contact.)

Lower Huronian: Conglomerate, graywacké, greenstone, quartz porphyry, amphibolite.
(Unconformity).

Keewatin: Quartz porphyry.

KEEWATIN

So similar lithologically is much of the Keewatin to the Lower Huronian, on account of the profound metamorphism which both have suffered, that only a small area of rock was noted which the writer was able to say definitely belonged to the former age. This was a small exposure one-half mile south of mile-post 117 on the C. P. R. where the pebbles of the Lower Huronian conglomerate consist of fine grained, greenish quartz porphyry, containing bright specks of quartz and feldspar. Under the microscope these are seen to be made up of a ground mass of interlocking quartz grains, with a few shreds of biotite, in which are imbedded some phenocrysts of quartz and orthoclase, the whole exhibiting a flow structure induced by pressure.

The difficulty in distinguishing the Keewatin from the Lower Huronian was early noted by N. H. Winchell in Vol. 5, Minnesota Natural Survey, page 6, where he writes:

"The oldest detrital rocks are abundantly mingled with volcanic tuff of a basic nature. Indeed the fragmental greenstones of the Keewatin are so intimately associated with the massive greenstones that they cannot always be distinguished from them, whether in the field or in the microscopic thin section. Starting from the plain igneous rocks, the characters gradually change by the loss of one feature after another and the acquirement of slightly different features until finally the whole petrographic nature of the rock at one end of the series is so altered that it is not warrantable to class the rocks at both ends of the series in the same category. At one end of the series the rock considered is plainly an igneous one, and at the other is plainly a fragmental one and it is only by the most minute and painstaking comparisons that some of the steps in the series can be assigned to this or the other end of the scale."

It may be timely here to introduce the following by W. N. Smith from his paper previously quoted, page 255.

"The most western exposure of the graywacké series is largely represented by a schistose conglomerate containing pebbles of the various phases of the underlying Keewatin, together with fragments of a massive granite and porphyry. The granite pebbles are probably derived from the Laurentian granites, which although not exposed in the area mapped, occur over a considerable area north of Port Arthur. . . . . . As the contact between the graywacké and the Keewatin is approached, the conglomerate character of the former disappears and the lowest member of the graywacké very closely resembles the Keewatin greenstones. It, however, can be distinguished from them by the presence of scattered fragmental grains, and by the absence in the graywacké series of the minute crumpling at right angles to the general schistosity which is characteristic of the adjacent Keewatin."

As the Lower Huronian conglomerate is made up almost entirely of porphyry pebbles, it was the writer's endeavor to find some area of the porphyry in place, and thus establish a known area of the Keewatin. However, he only succeeded in locating a very small area midway between mile 117 on the C. P. R. and Thunder Bay, as previously mentioned.

The lithological similarity of our Lower Huronian in the Port Arthur region to the rocks of the same age south of the lake on the Mesabi and Penokee ranges, is very marked indeed, and some specimens of the Lower Huronian conglomerate brought down by Mr. A. P. Low from as far northeast as lake Mistassini, in Quebec, struck the writer as being remarkably similar to those of Port Arthur.

Writers on the geology of the Mesabi, namely, N. H. Winchell and U. S. Grant, describe similar rocks as Upper Keewatin. Winchell and Grant called the greenstones Lower Keewatin, and the conglomerate which they recognized as being formed from the greenstone, Keewatin, but the study of field relations leaves little doubt of their being Lower Huronian, a fact brought out by Prof. C. K. Leith in his monograph on the Mesabi range.

THE LOWER HURONIAN SERIES

To the Lower Huronian belong rocks of both sedimentary and igneous origin. The sedimentary include interbedded conglomerate and graywacké; and the igneous, porphyry, amphibolite and fine grained trachytic rocks.

The graywacké and conglomerate make up by far the greatest part of the Lower Huronian, and they cover the most extensive territory of any of the formations in the district.

Normally, the graywacké is dark gray to dark greenish-gray in color, weathering to somewhat lighter tints. The bedding and schistosity are evidently conformable, both standing almost vertical, with a uniform strike of north 80 degrees east. In some places, owing to greater dynamic stresses, the graywacké has been altered somewhat to a hornblende schist, with the hornblende, mica and chlorite glistening on the parting planes of the rock. After examining many slides under the microscope, the graywacké was found to be fairly uniform in texture and composition, being made up of angular to subangular grains of quartz and feldspar which, after considering all the slides, appear about equally abundant. The cementing material in many cases seems to be chloritic and micaceous, and in others is replaced by a cloudy alteration of the feldspar.

Iron pyrites is abundant in most of the slides, though in some it has been altered to the oxide of iron.

No true slates were noticed, though in the neighborhood of intrusions some of the very fine grained graywacké was found to be metamorphosed into what very much resembled a dense compact slate. There has also been a very marked alteration of the graywacké, by the infiltration of quartz in the form of veinlets which conform as a rule to the schistosity and bedding. These graywackés seem to have been near shore deposits of feldspar and quartz mud, which has been metamorphosed into dense rocks by the recrystallization of much of the feldspathic and ferromagnesian constituents into fresh feldspar, mica and actinolite; and also by the infiltration of much silica in the form of veinlets and as cementing material. All the actinolite seems to be secondary, and to have been formed by dynamic metamorphism, but some of the mica has been deposited in its present position. The graywacké and conglomerate were noticed only in one place east of McKenzie Station (on the trail leading from Loon to Flaherty's) where in one small area may be seen a narrow band of very fine Lower Huronian conglomerate. West and north of mile-post 119, the graywacké and conglomerate shade into each other, the beds standing on end and striking north 80 degrees east.

Lower Huronian Conglomerate

The best outcrops of this very interesting rock may be seen along the cuts of the C. P. R. at mile-post 116.2 and westward. They are both thin and thick bedded, the layers ranging from a few inches in thickness to several hundred feet, and are now standing almost vertically, often in parallel bands between which are thin beds of the ordinary graywacké. In color the conglomerate very closely resembles the graywacké, and in fact so profoundly have both been mashed that on fresh cuts only careful scrutiny will enable one to distinguish the pebbles from the graywacké matrix; but on weathered surfaces the elongated mashed pebbles stand out very distinctly, owing to

Lower Huronian conglomerate on south side C. P. Railway.

differential weathering. The pebbles, which range from microscopic size to six inches or more in diameter, are composed almost wholly of greenstone (fine grained quartz porphyry) and graywacké. Many of the porphyry pebbles are weathered to a pink feldspathic looking material, which might lead to their being mistaken in some cases for granite pebbles. True granite pebbles were nowhere noted in this formation. Under the microscope these porphyry pebbles were seen to be fragments of trachyte, which had a fairly uniform composition as follows: fine grained ground mass of plagioclase and quartz showing flow structure, in which are imbedded many altered orthoclase,

plagioclase and quartz phenocrysts; much secondary quartz, some biotite and actinolite, and a great deal of secondary products such as chlorite, muscovite, talc and sphene.

Associated with the porphyry pebbles are others of what appear to be a form of lean jaspilyte. This would lead to the supposition that somewhere in the district was a region of Keewatin iron formation, and as the strike of the conglomerate is about east and west, the old shore line must have been some miles north of the present lake, and the region of Keewatin would probably be somewhere in that direction, and is at present probably covered by the Lower Huronian and granite.

The repetition of the bands of now vertically standing conglomerate are due to either the oscillation of the shore, or to the disturbed equilibrium between the source of the supply and the transporting power of the streams. The latter brought down the material, which was originally deposited in horizontal beds of conglomerate interlaminated with others of graywacké, and these were subsequently tilted to their present position. So much metamorphism have some of the conglomerates suffered that the pebbles have become squeezed, elongated and broken so as to closely simulate a porphyry, from which only careful scrutiny can distinguish them. The pebbles are drawn out to conform to the strike of the beds, which is north 80 degrees east.

The Amphibolites

On mining location A L 521 we first came upon an area of amphibolite which there intrudes the Lower Huronian graywacké. This intrusion may not be as continuous as shown on the maps, yet it occupies a large area. In several places the drift was too deep to admit of finding any outcrops. The amphibolite was found to be younger than the graywacké but older than the granite, which intrudes it, and at the contact includes many fragments of it. There have been later intrusions, in the form of small dikes, of a similar basic rock, which is very hard to distinguish in the field from the true amphibolite. The latter is however coarser grained and contains much less feldspar and under the microscope it is seen to be composed of large amphibole individuals some biotite and a small amount of plagioclase.

The amphibolite is frequently cut by dikes of a dense grayish rock. This under the microscope seems to be a fine grained schistose diabase in which the amphibole and biotite much exceed the feldspar.

Sea-green Porphyry

One mile west of Mackenzie at mile-post 116.5 and east of Mackenzie at mile-post 110 may be seen small areas of a dense grayish green rock showing quartz and feldspar in glistening grains, with some specks of pyrite. Where weathered this rock has a sea-green appearance, and under the microscope is seen to be composed of a fine grained ground mass of quartz and orthoclase, in which are imbedded phenocrysts from five to ten millimetres in diameter of the same minerals, with a few individuals of plagioclase. Of the secondary minerals muscovite and sphene are abundant, the latter occurring in vein-like aggregates. This rock intrudes the Lower Huronian graywacké-conglomerate.

MIDDLE HURONIAN

Granite

One of the most prominent formations in the district is that mapped as granite, though it really varies from pegmatite containing tourmaline and muscovite on the one hand, through syenite to a grano-diorite on the other, and to the north even shades into what might be called true diorite. It has been correlated with the Middle Huronian because it intrudes the Lower Huronian and is therefore younger and being overlain by the Upper Huronian is older than it.

North and east of Loon lake the granite forms a series of small rounded hillocks. This peculiar topography is not due to weathering or glacial erosion, but to the shape of the original eruption, which came to the surface or just beneath the overlying cap of Lower Huronian in the form of small bosses. In some cases large fragments of the Lower Huronian may be found sticking to the crest and the sides of the boss.

Light gray granite cutting Lower Huronian conglomerate.

Some of the pegmatitic phases of the granite bear a very striking resemblance to the tin-stone granites of Cornwall, and although no evidence of cassiterite was noted, it may have been overlooked owing to the difficulty of its recognition. In color the granite varies from a pink to a pinkish gray, with the pink predominating, and it occasionally becomes pegmatitic over large areas, the feldspar crystallizing out into individuals from a half an inch to an inch and a half in length. Such areas are capable of affording fine building material, which when polished ought to prove specially suitable for monuments, etc. All the culverts on the C. P. R. along this section have been constructed from massive blocks (up to five feet in length) of this material, and these afford a fine example of what may be done with it.

Examination of many thin sections of the granite from various localities showed the more acidic sorts to contain a great deal of micropegmatite, quartz and microcline,

some plagioclase and abundant garnet individuals. Some of the pegmatite varieties have large individuals of blue tourmaline, while muscovite, biotite and amphibole are also present, and the more altered varieties contain much sphene and chlorite. Some of the so-called granite, notably the later dikes, shade into a syenite porphyry composed of a ground mass of fine grained orthoclase, in which are imbedded many large crystals of the same mineral. In some of the granite dikes which cut the graywacké, hypersthene is abundant, and in places near the contact this mineral pervades both the granite and the graywacké. Some of the most basic varieties under the microscope closely resemble diorite, except that they contain somewhat more orthoclase than is usually seen in that rock. Along the lake shore, south of mile-post 121, the granite assumes the porphyritic phase above mentioned, some of the large rectangular individuals of the feldspar attaining a length of over one and a half inches. This rock undergoes a very peculiar change when weathered, becoming greenish and closely simulating in appearance and color a quartz diorite. Under the microscope the fresh varieties are seen to be made up of an equal number of orthoclase and plagioclase individuals, while quartz, amphibole and titanite are also present. In sections of the weathered varieties, the green color is seen to be due to an alteration of the feldspar and the ferromagnesian constituents to green fibres of chlorite.

THE ANIMIKIE FORMATION

The Animikie or Upper Huronian is the formation in which the iron ore occurs and is composed of several members which are in descending order as follows:

1. Black slate.
2. Upper iron formation.
3. Slate (somewhat calcareous).
4. Thin bedded impure limestones.
5. Iron formation proper.
6. Quartz conglomerate.

Black Slate

The Upper Black Slates, 150 feet or more in thickness, conformably overlie the Upper Iron formation, and have a gentle dip to the south, with which the cleavage is conformable.

They contain considerable pyrite, and though traces of carbonaceous material are evident, no sign of fossil remains was noted, in spite of the seemingly favorable conditions for their preservation. Intruded into the slates conformably with the bedding occur many of the Logan sills. A peculiarity which may be mentioned here is the deposition of graphitic carbon at Current river where the slates just under the bridge show a thin coating of carbonaceous material which may have been brought down by the stream in solution, probably in the form of hydrocarbon, and there reduced to almost pure carbon.

The Lower Slates

The Lower Slate is very similar in lithological appearance to the Upper, but in places has seams of calcareous material, and in the area north of Port Arthur shades at the base into the impure limestone.

Impure Limestone

An analysis of this rock by Mr. A. G. Burrows gave the following:

Insoluble residue	7.24	per cent.
Fe_2O	12.65	"
$CaCo_3$	52.10	"
$MgCo_3$	26.48	"
Al_2O_3	.66	"

It is dark gray in color and occurs in beds of one inch to six inches in thickness interbedded with the lower slate and taconyte beds.

Quartz Conglomerate

The quartz conglomerate, at the base of the Animikie, overlies unconformably the Lower Huronian graywacké and conglomerate, and also the granite. It is nowhere more than six inches in depth, and consists wholly of vein quartz with a few pebbles of jasper. It has been formed, no doubt, from the disintegration of the quartz veins which are so numerous in the Lower Huronian.

Iron Formation Proper

The Iron Formation Proper is a ferriferous cherty carbonate called taconyte by Winchell, and as this is the name by which these rocks are largely known to the miners and prospectors, it will be used in the following discussion.

The taconyte has a spotted appearance and in color is of various shades of gray, red, or green, according to its composition. It has a conchoidal to irregular fracture, and may be said to consist of a ground mass of crypto-crystalline, chalcedonic or finely pheno-crystalline silica, which is evidently of secondary origin and a precipitate from solution. Throughout this are distributed numerous rounded or subangular bodies or granules, averaging one-thirtieth of an inch in diameter, composed chiefly of a green mineral, very slightly pleochroic, and without distinct cleavage, which on analysis, proved to be ferrous silicate. The origin of these green granules has been one of the most discussed subjects in connection with the Mesabi and Penokee ranges, and has been attacked from various points of view by the very able geologists who have written on these deposits, namely Spurr[2] and Leith.[3]

The proper solution of this problem would be the solution of the origin of the iron ore deposits of the Mesabi, and of these north of Thunder Bay, because all the recent writers agree that the deposits as they at present exist, are concentrations of the ferriferous cherty carbonate. The composition of these granules has been worked out in great detail by both Spurr and Leith, and they agree in stating them to be ferrous silicate. From their similarity to the glauconite granules found in the green sands of recent times, as well as those of the Silurian period, Spurr in his bulletin, on the Mesabi, page 252, was led to call them glauconite granules. He says:

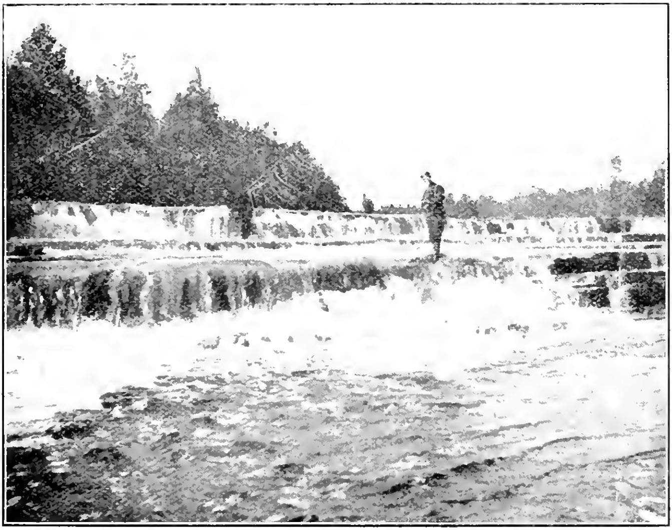
"Analyses showed this mineral to be essentially a hydrous silicate of iron, and selected sections kindly examined by Dr. J. E. Wolff of Harvard University, were stated by him to 'resemble in all physical character glauconite.' In one especially fresh specimen there were also rounded grains of calcite (probably magnesian), apparently originally detrital, and in some limited areas these increased in number till they formed nearly the whole bulk of the rock. These glauconitic carbonate layers are nearly identical in appearance with the glauconitic, St. Lawrence (Cambrian) limestone of Minnesota, of which sections were cut and compared. Dr. Wolff suggested tentatively that the rock was an altered greensand. There is, however, ... a constantly very small amount of potash."

This absence of potash was noted by Leith in the many analyses he had made of these granules, and as potash and phosphorus seem to be necessary constituents of true glauconite, he called these greenalite. Leith in his Mongraph on the Mesabi enumerates the following differences between greenalite and glauconite.

"The amount of alumina in glauconite averages 9 per cent. . . . . while less than 1 per cent. is found in the greenalite rocks, and this doubtfully belongs with the greenalite. The ferric iron in all of the best analyses of glauconite is in greater percentage than the ferrous iron. In the green granules from the Mesabi district ferric iron is nearly if not quite absent. The percentage of metallic iron in glauconite is on an average lower than that of the green granules of the Mesabi district. Glauconite contains a small percentage of soda. In the Mesabi granules soda is entirely lacking. Glauconite contains from 3 to 13 per cent. potassa, and indeed in descriptions of glauconite in standard text books the content of potassa is noted as a characteristic of it. In the green granules from the Mesabi district potassa is entirely lacking, and the granules are so fresh and unaltered as to preclude the idea that this substance was originally present and has been removed."

[2] The Mesabi Iron bearing rocks. Bull. Min. Geo. Sur. [3] Mon. XLIII. U.S. Geol. Sur. pp. 242-3.

Leith also points out that glauconite is nowhere to be found in beds of over 35 feet unmixed with much foreign material, while the greenalite of the Mesabi is over 1,000 feet thick, with but few thin layers of mud. This difference in the composition of the granules from true glauconite has been sufficient to cause a doubt in the minds of investigators as to whether the taconyte really originated in the same manner as did the glauconite green sands of the present day.



Falls on Current river, four miles north of Port Arthur.

Concerning the origin of the glauconite Murray and Renard[4] state (the italics are the present writer's):

"We are therefore inclined to regard glauconite as having its initial formation in the cavities of calcareous organisms, although we have admitted above that some grains which might be regarded as *glauconite appear to be highly altered fragments of ancient rocks or coatings of this mineral on these rock fragments.* It appears that the shells are broken by the swelling out or the growth of the glauconite, and that subsequently the isolated cast becomes the centre upon which new additions of the same substance take place, the grain enlarging and becoming rounded in a more or less irregular manner, as in the case of concretionary substances like silica, for example, which forms moulds of fossils. After the death of the organisms, their shells are slowly filled with the fine mud in which they are deposited. The existence of this organic matter in these cavities, and the absence of all other causes which might there induce the deposition of the silicates, in fact, the constant association of these phenomena, appear to demonstrate the existence of a relation of cause and effect. If we admit that the organic matter inclosed in the shell and in the mud itself transforms the iron in the mud into sulphide, which may be oxidized into hydrate, sulphur being at the same time liberated, this sulphur would become oxidized into sulphuric acid, which would decompose the fine clay, setting free colloid silica, alumina being removed in solution; thus we have colloid silica, and hydrated oxide of iron in a condition most suitable for their combination. To explain the presence of potash in this mineral we must remember that, as we have shown when speaking of the formation of the palagon-

[4] Report of the Voyage of H M S. Challenger, 1873-1878 "Deep-sea deposits," pp. 388-389.

ite under the action of sea-water, there is always a tendency for potash to accumulate in the hydrated silicate formed in this way, and, as we have stated before, this potash must have been derived from the sea-water."

Leith in quoting the above, remarks that it would be difficult for the quantities of iron found in the glauconite or in greenalite, to filter into the interior of the shell, and goes on to state that if the mud were derived entirely from the disintegration of basic rocks, the proportion of metallic iron would not be above ten per cent., but the actual percentage found in the granules is far higher than this. Analyses show it to be as high as twenty-five per cent. Leith also points out that this would require a larger amount of foreign material than is contained in the casts, and as foreign material is found outside the casts, he concludes that there is no reason why all of this material should not be drawn upon for the supply of iron. On page 254 of his Monograph he says:

"As the greenalite rocks of the Mesabi iron formation accumulated to a thickness of perhaps 1,000 feet, it would be necessary to assume that a thickness of detritus several times this figure originally was present to yield the necessary amount of iron to the granules. There is ample evidence that no such amount of detritus (in fact little or none beyond that now to be observed) was ever present in the Mesabi iron formation. This consideration calls for an additional source for the metallic iron of the Mesabi greenalite granules."

He then goes on to discuss the possible sources of the iron, mentioning direct precipitation from solution by organisms, and development similar to that of iron carbonate

The vast amount of excellent work done by Spurr, Van Hise and Leith on the Mesabi, and the very high standing of these geologists would certainly deter all lesser seekers of truth from encroaching on their field. The writer had therefore at first intended simply to describe and correlate the rocks in the Thunder Bay region, and avoid all discussion as to the origin of the green granules, but owing to his discovery of taconyte conglomerate in the Animikie, some new light seems to be thrown on the origin of the granules which the writer wishes tentatively to set forth.

The presence of a conglomerate in the Animikie composed of pebbles of taconyte embedded in a matrix of taconyte occurring in three or four separate thin beds would lead to the following conclusions:

The taconyte was deposited on an oscillating shore, which interrupted the deposition by rising above the water; this deposit was then broken up and contributed the pebbles of the conglomerate, and on a further sinking of the shore additional disposition of taconyte occurred; then as the shore was once more brought above the water another layer of conglomerate was laid down on the taconyte.

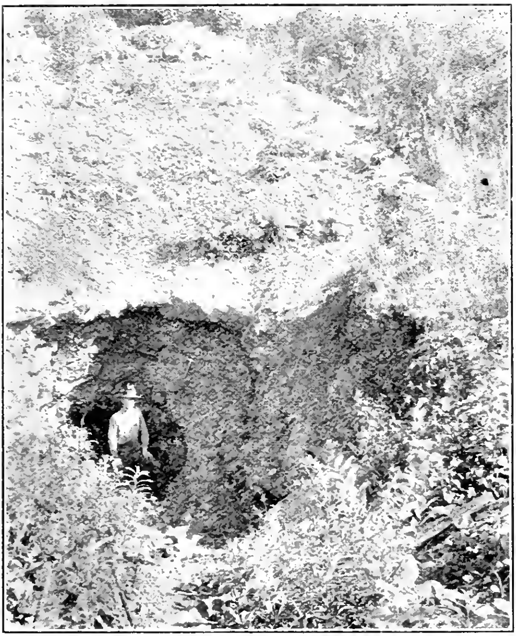
This condition, of course, prevailed at the shore, the taconyte conglomerate being an inter-formational conglomerate which was deposited at the same time as the taconyte was being laid down farther from the shore.

The assumption of the above conditions would lead one to the conclusion that the taconyte was some sort of a near-shore deposit, and the conditions which seem to the writer to most nearly conform to the above hypothesis would be the following.

Suppose we had a Lower Huronian or Keewatin peneplane with a sandy shore deposit, in which a concentration of magnetic iron was forming, intermingled with grains of the greenstone, similar to the magnetic sands of the present day. Then owing to change in the source of supply, calcium and magnesium carbonate and other alkaline solutions were brought down, filtering through the magnetic sands and depositing impure limestones off the shore. The magnetic and greenstone grains would then act as a nucleus about which concretionary layers of the lime would form. The alkaline solutions would at the same time dissolve some of the silica of the sand, thus rendering it free to form other concretionary layers about those just described. This would result in granules composed of a nucleus of magnetite or greenstone, with concretionary layers of calcium or magnesium carbonate and silica. On weathering, the calcium, or magnesium and silica, would react on the iron nucleus to form the green hydrous

ferrous silicate and thus form granules similar to those of the Mesabi. To the writer some such explanation seems to account very well for the high content of iron in the greenalite, which was one of the most difficult matters to explain in connection with their organic origin. These beds of taconyte were then faulted, and subjected to the ordinary process of weathering, much of the silica being dissolved out and re-precipitated in the veins of quartz crystals so common in the Animikie formation.

The banded taconyte of the Animikie, which simulates the jaspilytes of the other ranges, though not so distinctly banded, is really a fine grained chert containing the usual granules of the same composition as those of the groundmass, but the striping is due to iron oxide in evenly distributed particles.



Tunnel in Wiley's iron ore location.

The Upper Iron Formation is somewhat more slaty than the lower, has less taconyte in its composition, is higher in phosphorus and lower in iron.

The Iron Ore

The iron ores of the Animikie range consist mainly of hematite and limonite, throughout which may be seen almost unaltered to very much altered lenses of siderite. This siderite is very abundant throughout the ore of every pit and tunnel in the lower iron formation, and may be distinguished by its light color and by its glistening

appearance, due to reflection of the light from the cleavage surfaces. Magnetite occurs in small amounts generally near intrusions and is clearly a metamorphic product of the hematite.

The ore has been concentrated along and near the fault zones, much of it being changed to carbonate. That the deposits in question are still in process of formation may be seen by the presence in the ore of lenses of the comparatively unaltered taconyte and carbonate, which reduce the percentage of the otherwise high iron content of the ore. Unlike the Mesabi and other iron regions south of lake Superior, the deposits do not occur in pitching troughs, nor do they rest on an impervious basement. This may in part also account for the absence of the pure concentrations of iron ore so common to the south of the lake. The deposits here are however concentrations produced by meteoric waters circulating along faults, and the best ore occurs along the best defined faults, becoming leaner at a distance from them, and gradually shading into little altered taconyte.

Analyses of Iron Ores

The following are some analyses of the ores made by Mr. A. G. Burrows. The iron content is somewhat higher than indicated by the analyses as the high percentage of carbon dioxide in the ore is soon driven off in the furnace, leaving the remaining ore of a higher iron value.

	Per cent.
Tunnel E of Deception lake.	
Metallic iron	31.03
Sulphur	.09
Phosphorus	.167
Stripping east of Deception lake.	
Metallic iron	31.91
Sulphur	.06
Phosphorus	.321
Wiley's Pit No. 2.	
Metallic iron	35.11
Sulphur	.067
Phosphorus	.016
Cliff of Flaherty's.	
Metallic iron	27.64
Sulphur	.088
Phosphorus	.195
Flaherty's tunnel.	
Metallic iron	40.45
Sulphur	.021
Phosphorus	.021

KEWEENAWAN OR NIPIGON

The Keweenawan overlies unconformably all the other rocks of the district, namely the Lower Huronian graywacké and conglomerate, the granite and the Animikie. It consists of conglomerates, sandstones and impure marls, and shows its greatest development from Loon lake east, though a small area occurs about the western extremity of the lake. The series lies almost flat, with a slight dip towards the south and a strike of a little east of north. The conglomerate, which shades above into sandstone and impure marls, is made up of large boulders of granite, graywacké, Animikie (iron formation and slate), and amphibolite, in places rounded and water worn. The cut on the C. P. R. one mile west of Loon siding, is a fine example of this and also of the inter-fingering arrangement of the sandstone and conglomerate, which is explained

below. Northeast of Loon lake where the graywacke, granite, Animikie and Keweenawan come together, the conglomerate is composed of boulders of all of the younger rocks, and in many cases it shows an abundance of angular fragments of the taconyte formation of the Animikie, as well as of granite, graywacké, etc. In some places the conglomerate is at the base, and in others the quartzite holds this position; then again we have beds of conglomerate separated by a wedge of quartzite as seen in the cut one mile west of Loon. This structure may be explained by supposing a regression and then a transgression of the sea to have taken place. That is, that the deposition first took place on a rising sea floor, and then continued throughout a subsequent sinking of the floor.

Unconformity between Keweenawan and Animikie formations, east shore of Iron lake.

A very fine example of the unconformity between the Keweenawan and the Animikie may be seen on the east shore of the small lake north of Deception lake. In several places between Loon lake and Bass lake, the Keweenawan may be seen unconformably overlying both the Lower Huronian and the granite. The western boundary of this formation is marked by a great escarpment which extends from Silver lake in a southern direction almost to Thunder cape. This escarpment forms the boundary between the Keweenawan and the Animikie, and may be due to a great north and south fault, some evidence of which is occasionally seen along it.

The railway cut one mile west of Leon lake affords an excellent exposure of the Keweenawan conglomerate and also of the interbedded sandstone. Between Leon lake and Bass lake this formation rests unconformably both on the granite and the graywacké. The impure marl of the Keweenawan is capable of affording fine building material, and a great cliff of that material on the south shore of Thunder Bay is now being quarried by Wiley Bros. and Marks of Port Arthur, to supply excellent building stone, which is being largely used in the construction of some of the finest buildings of Port Arthur. It is light gray in color, and when dressed has a very pleasing appearance.

Throughout this formation occur veins of zincblende and galena, some of which have been known since the old silver mining days. Examples may be seen at Blend lake and at Silver lake, and farther east in Dorion township, where deposits were being worked last summer. It was found that almost invariably these veins occurred in a faulted area, the galena and blende bearing solutions having been accompanied by much silica, which invaded the surrounding Keweenawan and caused the sandstones to assume the character of quartzite.

The Dorion zinc and lead mine being a typical case of the occurrence of these minerals in the Keweenawan, the following description will be characteristic for the whole region.

The vein, which occurs at the contact of the granite and the Keweenawan marls, has a strike of north 40 degrees west and a dip of about 70 degrees to the west. It occupies a fracture zone due to a fault which occurred along this contact, the blende and galena impregnating the granite (the foot wall) and the Keweenawan (the hanging wall), in the form of veinlets, which fill the fractures for about 40 feet from the contact into the granite and 15 feet into the Keweenawan. The main concentration however, which is from three to three and a half feet wide occurs along the contact, which is the fault plane proper. The galena and blende solutions which were accompanied by silica, calcite and barite, filled the little fissures and cracks formed by the fault, and enlarged them by replacement, the more soluble brecciated material being removed and the ores and gangue minerals deposited in its place.

There was considerable development work done at this mine and the vein looked very promising.

THE LOGAN OR DIABASE SILLS

That this very important formation has been intruded into the sedimentary rocks of the districts after the method of a sill is no longer doubted. Andrew C. Lawson in his remarkable paper "The Laccolithic Sills of the Northwest Coast of Lake Superior"[5] set at rest all doubts on this point. The following is his summary of the reasons for calling these rocks "sills."

The trap sheets associated with the Animikie strata are not volcanic flows, because of the combination of the following facts:

(1) They are simply geological units, not a series of overlapping sheets.

(2) They are flat with uniform thickness over areas more than one hundred square miles in extent, and where inclined, the dip is due essentially to faulting and tilting.

(3) There are no pyroclastic rocks associated with them.

(4) They are never glassy.

(5) They are never amygdaloidal.

(6) They exhibit no flow structure.

(7) They have no ropy or wrinkled surface.

(8) They have no lava-breccia associated with them.

(9) They came in contact with the slates after the latter were hard and brittle and had acquired their cleavage; yet they never repose upon a surface which had been exposed to sub-aerial weathering.

[5] Bull. No. 8 Minn. Geol. Survey.

(10) They are intrusive sills, because of the combination of the following facts:

(1) They are strictly analogous to the great dikes of the region (*a*) In their general relations to the adjacent rocks and in their field aspects; (*b*) In that both the upper and lower sides of the sheets have the facies of a dense aphanitic rock, which grades towards the middle into a coarsely crystalline rock.

(2) They have a practically uniform thickness over large areas.

(3) The columnar structure extends from lower surface to upper surface, as it does from wall to wall in the dikes.

(4) They intersected the strata above and below them after the latter had become hard and brittle.

(5) They may be observed in direct continuity with dikes.

(6) They pass from one horizon to another.

(7) The bottom of the sedimentary strata above them, wherever it is observable, is a freshly ruptured surface.

(8) Apophyses of the trap pass from the main sheet into the cracks of the slate above and below.

(9) The trap sheets, particularly at the upper contact, hold included fragments of the overlying sheets.

(10) They locally alter the slates above and below them.

Again, on page 47 of the bulletin he says: "The sills are not only of later age than the Animikie, but they appear to be distinctly of post-Keweenawan age." That those sills are intrusive into the Keweenawan can be very well seen on the northeast side of Silver lake, but how much later they are in age we have no means of knowing, as there is nothing between the Keweenawan and the Pleistocene in this area.

In composition, the sills vary from diabase to gabbro or norite, but even in the latter the ophitic structure is well marked. At about five miles east of Port Arthur these sills serve as an excellent example of an intrusive assimilating the part of the intruded mass and so undergoing profound alteration. Prof. Lawson noted this locality, concerning which he says: "Another feature of interest, but also quite local in its occurrence, is the presence of irregular patches or blotches or blebs of quartz in the mass of the rock." But he did not explain the reason for this occurrence. This local irregularity is very well seen in the rock cut at mile 121.5, and is found to be part of a large diabase sill through which the railway cuts at that point. Examining the rock very carefully on all sides of the cut we see that this phase of the diabase gradually assumes the natural characteristics, the area affected being comprised within a radius of 100 feet from the face of the cut. At the eastern end of the cut the diabase overlies the slates, just a few feet from where the phase in question is so well noted, and very close to this contact fragments of the slate may be seen in the diabase in all stages of assimilation. A little farther away we get the blebby quartz and feldspar of the diabase.

The analyses of the three samples by Mr. Burrows given below show the stages:

(a) Diabase 50 feet from contact, normal.

(b) 10 feet from contact (porphyritic quartz and feldspar).

(c) At contact (contains fragments of partly assimilated slate).

	(a)	(b)	(c)
SiO_2	49.82	62.30	64.60
Al_2O_3	17.35	15.81	16.00
Fe_2O_3	1.76	2.19	trace
FeO	8.22	3.88	4.06
CaO	9.25	3.33	2.88
MgO	8.21	3.28	3.18
K_2O	.76	1.87	2.01
Na_2O	2.86	3.84	4.27
Loss	1.83	3.55	2.84

Sorting Operation on Loon Lake Ores

Some experiments in concentration were performed by Mr. Knobel of Port Arthur, the results of which were kindly given to the writer and are here appended:

"Some ore was taken out from three different places, with an endeavor to represent as large a cross section as possible of the ore bed, and then hand sorted into piles, measured up, sampled and analysed.

"The sorting was done chiefly by Finns who were entirely unaccustomed to handle iron ores, but I personally took part and found that it was feasible to make a perfect separation purely from the weight and not from the outside appearance of the sample.

"The following are the results:

Place	Cross section of ore body	Grades.	Tonnage. p. c.	Tonnage. p. c.	Iron. p. c.	Silica. p. c.	Phos. p. c.	Sulph. p. c.	Moist. p. c.
Tunnel	12 feet	No. 1	45 tons ...	72	55.20	16.60	.026	Nil.	0.12
		No. 2 ...	10 tons ...	16	28.24	51.80	.019	....	....
		Waste .	7 tons....	11 3	....	....	....	....	....
Cut 50 ft. east of tunnel	6½ feet ...	Original ore	....	....	53.61	18.24	....	....	....
		Sorted ore .	9½....	90	59.70	13.46	.027	Nil.	0.20
Pit 465 ft. west of tunnel	10 feet	Sorted ore .	5.......	50	51.48	22.59	.015	....	....

"The ore from the tunnel was divided into three grades, 1st, 2nd and waste, but as will be seen from the analyses, the 2nd grade should have been more closely sorted, a small percentage being added to the first grade, bringing that up to say 75 per cent. of the total tonnage, and the rest discarded. In round figures the result of the foregoing would show that 70 per cent. of the top ten feet of the ore body will produce a grade of ore averaging 55 per cent. iron, .022 phos. and 17 silica, and that 30 per cent. must be discarded as waste.

"It was also found in taking out the ore, that the lean cherty bands break big and the ore breaks small, and that in designing a plant for the practical hand sorting of the ore, advantage could be taken of this, by passing the material through say two sets of grizzlies, one a six-inch and the other of three-inch ring. I believe it will be found that 90 per cent. of the material remaining on the first grizzly and 75 per cent. on the second will consist of waste, which would very much facilitate the subsequent handling of the fines."

In conclusion, it may be pointed out that though the percentage of iron in the "run of mine" ore is low, as shown by Mr. Knobel's experiments, it may be greatly increased by concentration.

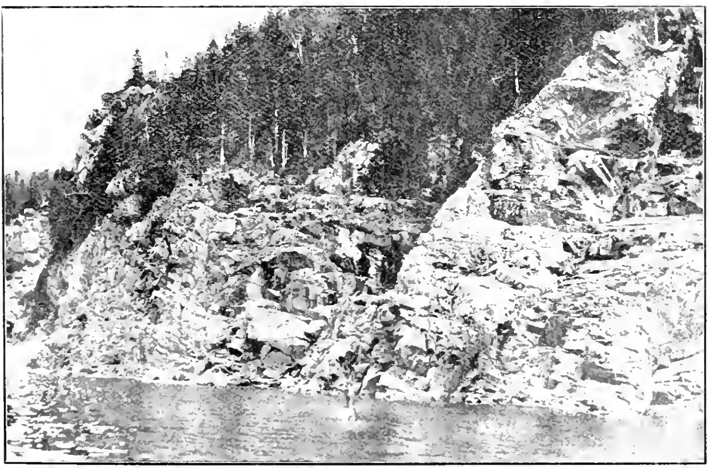
Acknowledgment is due Prof. R. W. Brock for much valuable assistance rendered the writer.

IRON RANGES OF EASTERN MICHIPICOTEN

BY A P COLEMAN

Introduction

Much interest has attached to the iron formation northeast of lake Superior, since the Helen iron mine, at present the most important in Canada, was opened up. Many prospectors have worked over the region; the former Lake Superior Power Company has explored it carefully on its own account; and the Bureau of Mines of Ontario has had parties engaged in mapping the iron ranges. The region including the Helen mine itself was mapped and reported upon by the present writer and Professor A. B. Willmott in 1902;[1] and afterwards the outlying parts of the formation, especially to the north and west, were mapped and described by Dr. J. M. Bell, whose report appeared in 1905.[2]



North Shore, Lake Superior.

In accordance with the instructions of Mr. T. W. Gibson, Director of the Bureau of Mines, my field work during the past summer was directed toward completing the mapping of the iron formation in the comparatively unimportant parts of the region to the south and southeast of the Helen mine, and some isolated bands of the formation to the north. Curiously enough, a range of considerable magnitude was recently discovered only a mile or two from the Helen mine, between it and the Magpie river on the northwest, within territory supposed to have been carefully covered by prospectors, and

[1]Bur. Mines, Ont., Vol. XI, pp. 152-185. [2]Ibid., Vol. XIV, Part I, pp. 278-355

included in Dr. Bell's map. This has been mapped during the past summer, and will be described in the present report. Most of the region has been carefully reported upon in the two papers just referred to; the previous literature on its geology has been detailed, and the general topography and geological relationships have been discussed; so that little need be added from those points of view.

The Geological Nomenclature

Since the former papers appeared the geological nomenclature of the lake Superior pre-Cambrian has been discussed and adjusted by a committee of American and Canadian geologists, so that the terms used in this report will differ from those employed by Prof. Willmott and myself, on the one hand, and by Dr. J. M. Bell on the other, though the distribution of the rocks in the field and the colors used in mapping them will not be changed.

For convenience the three systems of nomenclature are given beneath, No. I being that of Willmott and myself, No. II that of Bell, No. III the one recommended by the Pre-Cambrian committee:[3]

I.

LAURENTIAN	Gneisses and Granites
UPPER HURONIAN	Acid Eruptives Basic Eruptives Dore Conglomerate
LOWER HURONIAN	Eleanor Slates Helen Iron Formation Wawa Tuffs Gros Cap Greenstone

II.

KEWEENAWAN	Basic Eruptives
POST HURONIAN	Acid Eruptives
UPPER HURONIAN	Dore Formation
Unconformity	
LOWER HURONIAN	Helen Iron Formation Michipicoten Schists, etc.

III.

CAMBRIAN	Upper Sandstones
Unconformity	
PRE-CAMBRIAN	Keweenawan—Basic Eruptives and Conglomerate
Unconformity	
HURONIAN	Dore Formation
Unconformity	
KEEWATIN	Helen Iron Formation Gros Cap and Wawa Schists and Eruptives
Eruptive Contact	
LAURENTIAN	Gneisses and Granites

It will be observed that Dr. Bell omits the Laurentian from his series of formations, though Logan himself described it as existing at Michipicoten, and all later geologists working in the region have used the term. His reason for so doing seems to have been the impression that the Laurentian is necessarily older than the Huronian, but the general experience of Canadian geologists to the contrary and the final decision of the correlation committee leave no doubt that in the main the granites and gneisses of the region should be regarded as truly Laurentian.

DEVELOPMENT OF THE DISTRICT

The Michipicoten region first attracted attention in 1897 as a gold mining district, hundreds of locations being taken up in the next two or three years to the north of Wawa lake. On many of them free gold specimens of a promising kind were found, but none of the prospects discovered can be said to have developed into mines, except

[3] Bur Mines, Ont., Vol. XIV, Part I, pp. 269-277.

the Grace, which was worked for some time, apparently at a profit, by the Lake Superior Power Company, but was closed down in 1903 along with all the other enterprises of that company, owing to financial embarrassment. One or two of the prospects were located on fragments of the Helen iron formation. The location including the Helen mine itself was first staked as gold-bearing, but soon turned out to be of vastly greater value as an iron mine.

The gold excitement of the later nineties caused the founding of two villages, the Mission near the mouth of Michipicoten river, and Wawa City on the shore of the lake of the same name. Little of permanent value resulted, however, except the building of some miles of wagon roads and the opening up of two or three farms which are still occupied.

The Helen iron mine has been the occasion of more important opening up of the district by means of wagon roads, railroads and steamers. The old Grasett road from Michipicoten to the Canadian Pacific railway at Grasett has been repaired and is regularly in use during the winter, when navigation is closed. The railway, eleven miles in length, between Helen mine and Michipicoten harbor is in constant use, but the Josephine branch is idle, and the main line of the Algoma Central, from Sault Ste. Marie to Josephine, and then on to the northwest, is still unfinished. As far as Josephine the grading is done and ties are ready for track laying, but bridges are lacking and rails have been laid only about 70 miles north of the Sault. Northwest of Josephine the line has been located but not graded.

In many parts of the region these railways and the "tote" roads made during their construction give access to the iron ranges, in other parts canoes must be used or one must tramp through the woods. Numerous townships have been surveyed or blocked out to provide for the allotment of lands granted by the Legislature to the Algoma Central railway; and the lines and mile-posts are of service in fixing the position of ranges. In our own case this has been done mainly by pacing on compass lines to the nearest fixed point.

During the summer two assistants were engaged in the work, Mr. T. L. Goldie being with me from the first, and Mr. E. S. Moore joining the party later. After my departure the work was continued for some weeks under the direction of Mr. Moore. Both gentlemen gave efficient service, the topographic side of the work having been done largely by Mr. Goldie, while Mr. Moore attended to the geology during the latter part of the season. His work, where independent of mine, will be described at the end of this report. As canoemen and guides, Indians from the Mission were employed and gave fairly good service when in the field, but were quite untrustworthy when in the settlements.

A map prepared by the geologists and topographers of the Lake Superior Power Company, mainly under the direction of Prof. Willmott, has been of the greatest service, and the kind aid and advice of the Professor must be acknowledged as having helped forward our work in important ways.

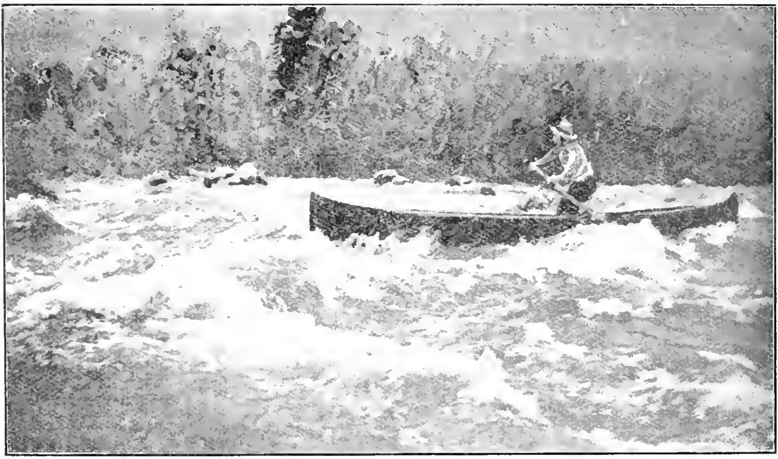
REGION SOUTH OF MICHIPICOTEN RIVER

Topography

The region south of Michipicoten river is typical rocky lake country overlaid with morainic material and old lake deposits in many places. The hills, though generally round topped, present steep slopes toward the valleys and often drop off in impassable cliffs one hundred or more feet in height. None of the hills rise much over 1,000 feet above lake Superior, but many reach 900; and magnificent cliffs face the east shore of the lake, giving comparatively few landing places and still fewer good harbors.

Two or three small and generally swift rivers or creeks flow westwards into lake Superior, such as Old Woman and Brulé rivers, having a course of not more than 15 miles, draining deep valleys with numerous little lakes. The eastern side of the region has larger lakes and less impetuous streams tributary to Michipicoten river, the most important being Anjigomi river draining a half dozen lakes of considerable size.

The Michipicoten is much the largest river flowing into the east side of lake Superior. It is about 175 miles long, heading in lake Wabatongusheen north of the Canadian Pacific railway, passing through Dog lake, Manitowick lake and Whitefish lake, all large bodies of water, and emptying into the northeast angle of lake Superior. It receives many tributaries, and often has a width of several hundred yards in its lower course. The part of special interest here extends from the westward bend, a few miles south of Whitefish lake, to Michipicoten bay, a distance of more than 20 miles, including numerous curves and meanders in the lower portion. Below the junction of Anjigomi



Running a rapid, Michipicoten river.

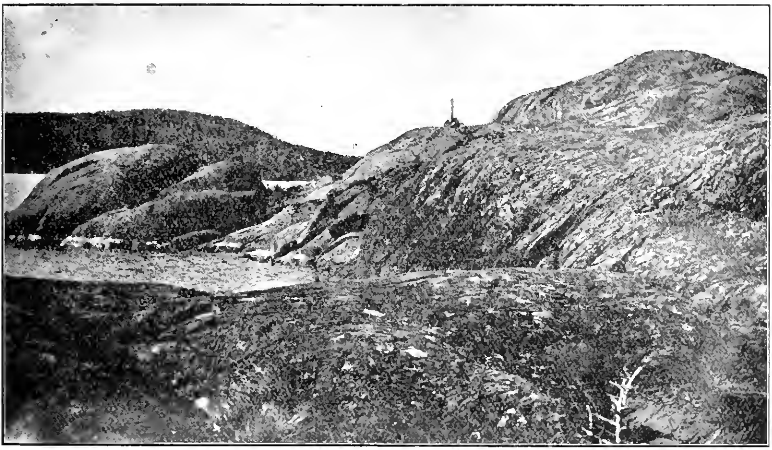
river the Michipicoten flows with a fairly swift current over a bottom of rounded stones derived from morainic and old lake deposits. In high and medium water it forms an excellent canoe route down stream, but in low water is in places shallow. Up stream the current is often so swift as to require poling.

Six or seven miles by road above its mouth the High falls of the Michipicoten interrupt canoe navigation, necessitating a two miles portage. The drop is estimated at 128 feet, and the falls are in two parts over a peculiar porphyritic granite. Surveys have been made for a power plant at this point, and sufficient power could easily be obtained for all probable mining and railway purposes of the region.

Below the falls for two miles there are violent rapids, so that the whole drop from above the falls to lake Superior is estimated at nearly 200 feet (aneroid). Below the rapids the river resumes its usual character, being shallow with a swift current over coarse gravel and rounded stones, until near the Mission. Here Magpie river comes in over a fine fall, and the combined channel is wider but with shifting shoals of sand and

mud. There are at present two outlets, a small one toward the north between a rock, island and the mainland, and a larger one to the west, interrupted by large sand bars. Until a few years ago the small outlet was closed with sand, but storms have removed the sand and it is now the usual channel taken by boats going to Michipicoten harbor.

Below the rocky portion of its valley at the High falls the Michipicoten flows between high banks of stratified sand and gravel, which it is rapidly cutting at bends, giving fine exposures of the old lake deposits. At one bend canoes going up stream make a portage of three or four chains and avoid two or three miles of swift water. The last bend towards the Mission was even more extravagant until, about 26 years ago, the Hudson Bay Company had a channel cut through the neck, where it was only 100 feet wide. The river quickly made use of the new channel and cut off the bend, which is now called Dead river. Since that time the upper opening to the oxbow has been silted up, but the lower outlet is still open.[4]



Roches moutonnees, Michipicoten Harbor.

Blackinton's Claims

Two or three miles south of the Mission, near the mouth of Michipicoten river, a number of small areas of iron formation occur on or near Bridget lake, and the locations are generally spoken of as Blackinton's claims. Bridget lake empties by a small swift stream into lake Superior half a mile to the west, but it is most easily reached by canoe, up the Michipicoten for a mile, across a portage on gravel plains to Pike lake, and from this through Round lake, Cross lake and two small nameless lakes to the west. On the last portage into Bridget lake an irregular band of iron formation is crossed and may be followed from northeast to southwest for about 200 paces, but with very unequal widths. At various points it has been stripped, showing in some cases black cherty looking material heavy with magnetite, in others fine sandy looking rock with little ore.

[4]For a fuller description of the Michipicoten see Prof. Willmott, Bur. Mines, 1897, pp. 188-192.

The next largest deposit lies south of Bridget lake, between it and a small tributary pond. Here the Iron formation consists mostly of whitish, sandy looking silica without any large amount of iron ore.

The other outcrops on islands, etc., are too small to be of much practical importance.

What probably represents an extension of these bands of iron formation occurs about a mile west on the shore of lake Superior. It is lean and sandy looking, and somewhat mixed up with greenstone and porphyry. At the southeast end the ordinary banded silica passes into black slate and pyrites.

North shore, Lake Superior.

South of Bridget lake small outcrops of iron formation occur at a number of points, the west end of Junction lake, at each end of Island lake, and between Peter's lake and Centre lake. At the outlet of Island lake into Noisy river the formation is different from the varieties mentioned before, consisting of pretty heavy magnetite interbanded with a green silicate, some of which may be rich enough in iron to constitute an ore. The other bits of iron formation are chiefly of the sandy variety and without much promise of ore. The enclosing rocks are porphyrite and schist with a roughly east and west strike.

The Iron formation near Peter's lake will be described later by Mr. Moore.

Iron Formation near Mijinnemungshing

To the west of lake Mijinnemungshing a number of claims have been located on Iron formation. These may be reached by six miles of rough road southeast of Brulé bay, or by a canoe route from the lakes previousy mentioned, through Great lake, Bottle lake, Summit lake, Bear lake, Pickerel lake, Trout lake and Almonte lake.

Starting in from the mouth of Old Woman river on Brulé bay a small bit of Iron formation is found near the north side of the second township inland from Cap Choyyé. This includes some rather heavy magnetite with green hornblende as well as the usual lean banded silica.

Nearly two miles to the south of this, about the middle of the township, a hill of Iron formation rises sharply from a plain of old lake deposits, and from point to point similar material may be traced for about three miles to the east. The hill just mentioned rises nearly 100 feet above the plain with almost vertical cliffs, forming a ridge which may be followed for a quarter of a mile, with a width in places of more than 100 paces. The banded silica is of the usual lean kind, with nearly east and west strike and vertical dip. The smaller bands to the east are of the same character but narrower, and they should perhaps be connected up as two fairly continuous outcrops, but drift and forest made the tracing difficult The associated rocks are chiefly green schist and greenstone, but some rusty sericite schist occurs also, very like part of the enclosing rock of the Helen mine.

On the northern extension of Mijinnemungshing, about midway along the north shore, a considerable band of rusty banded silica occurs, and opposite it on the southeast shore there are rusty surfaces of a sericite schist containing siderite, which should perhaps be included in the Iron formation. Near the last exposure a bright red monzonite, or augite syenite, runs for at least 100 paces. The other rocks observed are the usual Keewatin schists and basic eruptives.

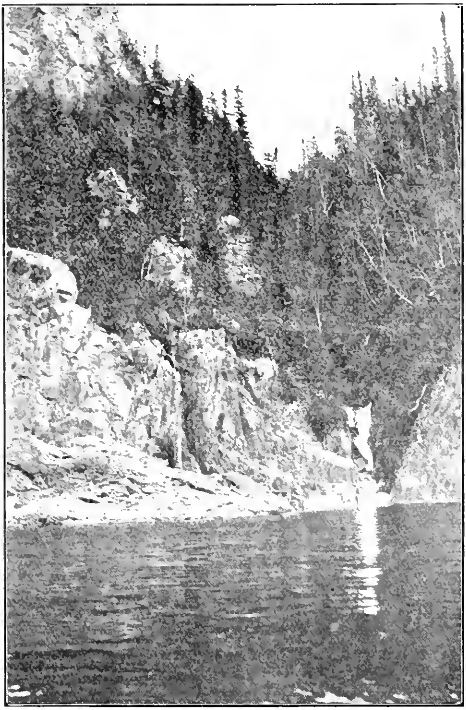
Iron Ore Southeast of Cap Choyyé

Inland from the shore of an exposed bay, about two miles southeast of Cap Choyyé, a small deposit of impure hematite occurs, but without the usual rocks of the Iron formation. A sharp ridge of brecciated material, three or four feet wide, stands nearly vertical and runs about fifteen feet to the east, beyond which rusty patches may be seen at some points. The ore is generally bright red hematite, to a less extent black, with no magnetite, and small pieces of good quality are found, but all the larger rusty blocks contain much barren rock. The adjoining rock is pale green schist with some pyrite, striking in the same direction. The source of the ore is not clear, but the amount to be seen is too small to give the deposit any practical importance. The facts that no Iron formation is to be seen, and that the rock mixed with the ore is shattered and slickensided suggest a quite different origin for this little deposit from that usual in the region. Solutions moving along a fault plane seem to have brought the ore to its present position.

Iron Formation near Lake Anjigomi

An interesting development of the Iron formation just to the east of lake Anjigomi was stripped and explored last summer by Mr. Edgar Brown. A railway cutting discloses coarsely banded silica with magnetite, thrown into small sharp folds and associated with bands of green schist. There are three strips of Iron formation with a total width of about 27 feet. On a hill side to the east the formation widens to about 60 feet, with some interruptions of schist; and the character of the formation changes, becoming black and heavy with magnetite. Some parts contain green hornblende instead of silica, and remind one greatly of the Iron formation at Moose Mountain mine in Hutton township near Sudbury.

The banded silica can be followed as a narrow band along the north side of a little lake, and then turns northeasterly, and in places widens out to 90 feet on a hill side. The range then stops rather suddenly at a hill toward the northeast end, apparently cut off by red granite, which penetrates the Keewatin greenstones and schists as large bosses and dikes. The richer parts of the Iron formation here seem heavy enough to form ore of fair quality. If any large deposits can be found it will be another instance like that of Hutton township, where the Iron formation itself is nearly enough pure



North Shore, Lake Superior.

magnetite to be workable. In the American iron ranges this type seems not to be found, since all the ore bodies worked are concentrations of secondary ore derived by leaching from comparatively poor Iron formation in basins which arrest the flow of solutions.

Iron Formation on Lake Mishewawa

Along the northeast side of lake Mishewawa a steep ridge rises between two bays, and crossing the ridge in a northwest and southeast direction is a strip of Iron formation consisting of banded granular silica or quartzite, with magnetite enough to render

the compass useless. The green schist adjoining is often finely banded, as if a transition rock between the ordinary schist and the Iron formation. The strike of the schist and of the banded silica is across the sharp, steep walled ridge, a most unusual arrangement. At the outlet of a small lake tributary to Mishewawa banded silica occurs again on a small scale, and may be continuous with the outcrop described above, though it was not found on the wooded and drift-covered country between.

About two miles east of lake Mishewawa there is a considerable outcrop of Iron formation on the township line at about the fourth mile south of the northeast corner; and a still larger series of outcrops occurs to the northwest toward the High falls of Michipicoten river. The latter is described by Mr. Moore in a report appended to the present one.

Goetz Claims

The most surprising recent development of the Iron formation of the region was the finding of a large band within two miles to the northwest of the Helen mine, in a part which was supposed to have been carefully explored. This has been stripped and made accessible by Mr. Alois Goetz, who has taken up a series of claims upon it. The range is known to extend for a mile and three-quarters in a direction somewhat south of west and to have in places a width of 200 paces, with some schist intermingled. Part of the range rises as the usual steep ridges, but other parts are in low ground and more or less drift-covered. The formation includes quartzitic and also granular silica, often with magnetite enough to disturb the compass greatly, pyrites, porous black slate and schistose siderite, almost all the forms occurring at the Helen mine. Much of the banded silica has been crushed to a breccia. All the features of the range at the Helen mine seem to be repeated here, except that the band is only about half as wide; but thus far no important mass of ore has been found.

Parallel to the Iron formation along the north there is a fairly thick belt of black slate (Eleanor slate), but most of the enclosing rock is green schist or greenstone of the Gros Cap formation, or paler schist belonging to the Wawa tuffs.

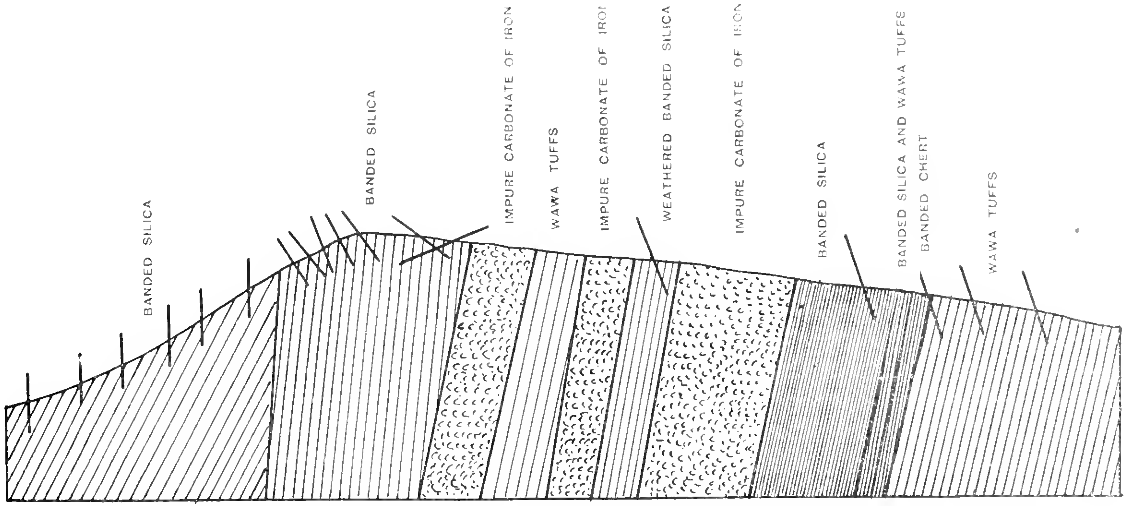
As the examination of this range was completed by Mr. Moore, his account is given as follows in his own words:

"The most interesting and important outcrop of the Helen formation seen in the region is the property of George Goetz. This had been examined by Dr. Coleman, but the writer visited it later, when some trenching had been done, and made a cross section of the claim. The trench along which the measurements were taken runs along the north and south line at the west end of the George Goetz claim.

"The removal of the soil exposes in several places large masses of rock, which consist mainly of carbonate, and which weather with a thick brown layer on top. These masses lie embedded in the banded silica and extend rather regularly across several of the trenches, which are about sixty feet apart. Thy appear at first sight to resemble dikes, but they have no doubt been formed by deposition of sediments of different composition from the banded silica, and have been laid down between the bands of silica-bearing rock.

"One specimen from the claim was found to be greenish gray in color, weathering somewhat rusty, coarse-grained and massive, and composed of impure carbonate and chlorite. This rock has been formed by deposition of carbonate from chemical sediments while the chlorite has probably been supplied from rocks which have yielded mechanical deposits. As this particular type was not observed in large quantities possibly its formation is somewhat of a concretionary nature.

"The bands of carbonate have had a considerable influence upon the banded silica rock, this being seen in the brecciation of the latter rock where it has been folded over and around the former.

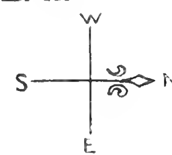


CROSS SECTION OF GEORGE GOETZ'S CLAIM

Showing Bands of Helen Iron Formation and Contact Rocks

STRIKE

SCALE – 150 FEET = 1 INCH



"Between the carbonate and the country rock there are some bands of banded silica, but the great mass of the silica rock lies to the south of the former rock. The diagram shows very distinctly the nature of the deposits and the close relation between the country rock, Michipicoten schists, and the Helen Iron formation.

"The schists here are of the type called Wawa tuffs. They are flesh gray with rusty spots, and have the composition as shown by a microscopic section, of a felsitic ground mass containing porphyritic crystals of feldspar, mostly plagioclase, one crystal of quartz and many crystals of carbonate, possibly ankerite.

"The rock rises quickly from a valley at the south end of the claim to a height of one hundred and fifty feet, and then slopes gradually away to the north end. There is a mass of pyrite in the trench to the east of the one along which the section was made, the only mass of pyrite of any extent seen in the deposits. The dip of the rock varies from almost vertical to seventy degrees to the south.

"Some banded cherty rock was found, but the larger part of the iron range rock is composed of typical banded silica similar to that in the region of the Helen mine."

Iron Formation among the Gold Mines

At several of the gold mines hints of the Iron formation are found, and there can be no doubt that the disturbed mass of eruptives and green schists in which the gold was found include small patches of it. Only one band of any magnitude is known, however, that on Barton's claim (1582), near the Grace mine road. On this claim there are two parallel bands showing in small workings just south of the road, one six feet wide, the other four, with seven feet of green schist between. On the larger band a drift has been run forty feet into a hill, and on the smaller one a shorter drift. The Iron formation is of white granular silica, with bands of darker material and often much pyrite, in thin bands or irregular masses. The bands run 165°, stand vertical, and can be traced over the hill for about 100 feet The enclosing rocks are pale and dark green schist, having about the same strike and dip as the banded silica. A dike of biotite picrite cuts the formation in a northeast and southwest direction in one of the workings.

There is very little iron oxide in this deposit, pyrite or marcasite largely replacing it, as in the Goudreau lake deposits, to be described later. Though some gold was found here, the amount seems to have been unimportant.

There are indications of small bits of the iron range at the Grace and Minto mines also, in the latter case consisting of black slate with pyrite, and it may be that some gold accompanied the silica which was in solution when the granular silica was deposited; or perhaps the brittle iron range rock was shattered during later eruptions of granite or diabase, affording channels for the gold-bearing solution to circulate in and deposit its sulphides and gold.

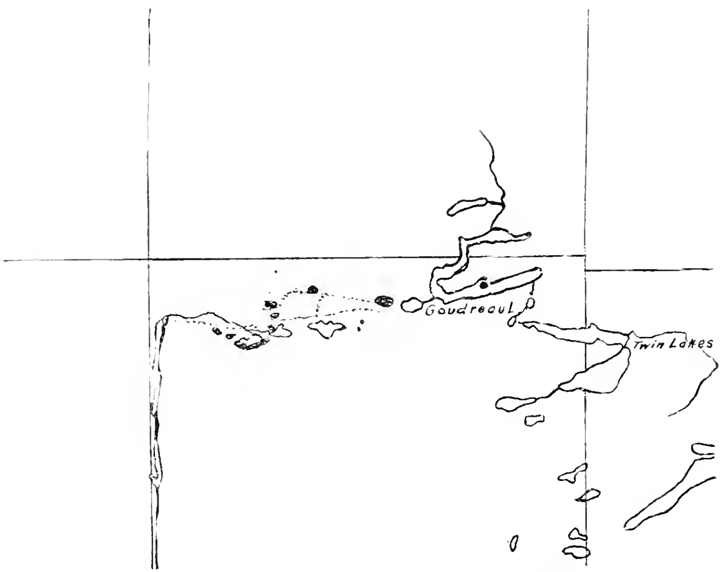
Goudreau Lake Pyrites Deposits

Much the most interesting, and, from the economic standpoint, by no means the least important, of the mining claims visited during the summer was the series of pyrites deposits near Goudreau lake. At first it seemed doubtful if they should be included in the Iron formation, since crystalline limestone and iron pyrites are their two prominent features. However, there are also suggestions, such as a considerable amount of banded silica and black slate, making it certain that these deposits are simply an extremely sulphurous variety of the Iron formation. It is known that the Iron formation at the Helen mine originally contained its iron largely in the form of pyrites, and there are still thick bands very rich in pyrites just south of Sayers lake, the next body of water to the west of Helen mine.

We had the good fortune to be guided in our work at Goudreau lake by Prof. Willmott, who had examined the property before. Without his aid we should hardly have found all the scattered pits which have been sunk on the property.

The region can be reached by canoe on Wawa and Hawk lakes and McVeagh's creek, from the northern end of which a portage over hills for about two miles toward the east brings one to the deposits. Or one may come in from the east from the Emily mine on Dog lake, a portage of three miles leading to Jackfish lake and a chain of small lakes ending westwards at the ore deposits.

Banded schist with rusty streaks suggests the deposits as one turns east over the hills from McVeagh creek, but characteristic material is not seen until a succession of ponds is reached, running east and west through the property.



Map of Goudreau Lake pyrites deposits. Pyrites ● Scale, 2 miles one inch.

The first outcrop toward the west, named "E" by the prospectors who explored it, runs east and west for about 100 feet, and in cross section shows from south to north:

Pyrite with some green schist	8	paces.
Limestone (mostly hidden by debris)	6	"
Pyrite	4	"
Green schist (strike 100°, dip 60° S.)	33	"
Pyrite with some cellular silica	29	"
Very rusty banded silica (dip 25° S.)	19	"
Width of section	98	paces.

Just to the west of the hill top on which the section was measured, the limestone and much of the pyrites have been dissolved out as a narrow ravine, and here a shaft 25 feet deep has been sunk. The materials on the dump are mainly limestone, but with some bands and knots of green schist and many masses of pyrite, sometimes interbanded with the limestone. The limestone is exactly like that of the Grenville series, but the silica at the north end of the section is unmistakeably Iron formation, though with little interbanded magnetite. The pyrites often has a porphyritic look, large crystals being embedded in a finer ground mass.

A quarter of a mile to the east another hill contains a large amount of pyrites at deposit "D," shown massively by the stripping, but mainly covered with a thin sheet of gossan, the largest outcrop being about 90 by 25 feet in dimensions. Just to the west between the two hills lies a muskeg with a pool having yellow ochre at its bottom. No limestone was seen on this hill

Still farther to the east, there are small outcrops of pyrite for more than 100 feet, when the hill sinks away toward bouldery ground, followed by a small lake. Along the south side of this pond gossan shows at many points on the steep bank, and stripping discloses more or less pyrite, with a little pyrrhotite. The bottom along the south shore is often covered with gossan, and the lake basin may represent pyrites and limestone, now dissolved away.

Near the east end of the small lake, on the edge of the hill there are interesting sink holes representing the solution of sulphides.

A short distance to the north of this lake along the path from outcrop "E" a nearly straight band of crystalline limestone was followed for 410 paces. In some places it is 30 feet wide, though generally less than that, and parallel to it on the north runs a long depression, sometimes showing gossan on its north side, and perhaps representing a band of pyrites. The limestone is white or gray, and dips about 80° to the south, with a strike nearly east and west. After the 410 paces diorite seems to cut off the limestone, but 160 paces to the east there are two sink holes running east and west as narrow trenches. The largest is 15 feet long and 8 or 10 feet deep, with six feet of partly decomposed pyrite at the bottom.

Somewhat to the east of these sink holes and a little north of the second small lake, there is a low hill of gossan, 200 paces long from east to west, and about 120 paces broad Most of the hill is covered with small pines, but where these have been overturned rusty banded silica may be seen, containing some pyrites. The dip and strike were not clearly determined, the dip seeming to be very flat in some places, but as high as 60° N. in others.

Still to the north along a road are found deposits "C," some of which contain fairly pure pyrites, as shown by several strippings, one extending for 50 feet. In places the pyrites is interbanded with granular silica or has a band of chert to the north, and in one stripping a little impure siderite was found with the silica

Deposit "A," to the northeast of "C," is very interesting, owing to the sink holes and small caverns resulting from the weathering of pyrites. Toward the east end there are two depressions, one 120 feet long, the other 80 feet, with their longest diameters nearly east and west. They are about ten feet deep and are floored mainly with peat. Along the northwest wall of the more westerly depression there are pits and small caves of natural origin, but suggesting mining operations. The longest cave runs in ten feet and has about the same depth, the roof being of rusty pyrite and the floor of gossan. One natural open pit is about 10 by 25 feet in dimensions. There is a larger flat depression to the southeast of the two just mentioned, but with no evidence of pyrites.

To the northwest and west of the depressions just described, a gossan-covered hill runs westerly with green schist on the north and more or less pyrites on top and along the south side, where a band of crystalline limestone ten or fifteen feet wide stretches for about 150 feet. At one place a cave opens into the limestone, roofed with limestone and gossan, the bottom being largely covered with blocks of limestone. Here the limestone seems to arch over the pyrites.

A section across the low hill near its west end shows green schist to the south, then limestone with some pyritous schist, 30 feet of pyrite, 12 feet of green schist, 9 feet of pyrite, and green schist to the north. There seems to be little continuity in the structure however, and sections at different points vary greatly among themselves. Pyrites or gossan extends about 400 feet from east to west, with a width of about 150 feet, but it is greatly mixed with other materials, especiallly schist and limestone. It is stated that a diamond drill hole on "A" claim showed pyrite to a depth of 169 feet, averaging about 35 per cent. sulphur.

The Bear Claim

The most easterly deposit, called the Bear claim, displays many interesting features, and has the largest extent of all the outcrops seen, with a length from east to west of 1,200 feet and a width of nearly 300. To the west there is low peaty ground with small pools containing a foot or more of ochre or bog ore, probably leached from the deposit; and much of the deposit itself is gossan-covered or hidden beneath drift. A stripping near the middle shows gossan or pyrite at several points across the strike over a width of 150 feet, but no stripping crosses the full width. Toward the east, walls of green schist, or schistose hornblende porphyrite, rise on both sides, and at the east end of the deposit the appearance is that of an amphitheatre with walls 50 or 75 feet high. Here pyrites seems to dip in all directions under the hornblende porphyrite, as if it was a dome with the top removed. The pyrites has weathered out near the top of the wall of the amphitheatre, leaving the schist projecting over it like an eave. Whether the valley was formed by the destruction of pyrites is uncertain, but the arrangement suggests this. The pyrites of the Bear claim seems more mixed with rock matter than in most of the deposits, but it covers a far larger area than any of the others.

The length of the series of outcrops from east to west is 2½ miles, and at the end of the first little lake there are outcrops over a width of half a mile; so that a considerable territory is more or less covered with pyrites or gossan formed from it. The total amount must go into the millions of tons; but undoubtedly much of it is too low grade to be profitably used. With selection there should be a large amount available, reaching a percentage of 35 or 40 in sulphur, and a considerable amount still higher in grade.

There is very little magnetic disturbance near some of these deposits, but at others the compass is untrustworthy, probably, however, from the presence of pyrrhotite rather than of magnetite. The iron of the Goudreau lake range must be looked on as almost entirely combined with sulphur rather than with oxygen, as in almost all other ranges.

The large amount of crystalline limestone is most striking in a region so devoid of limestone as that north of lake Superior. One band near the west end of the series of deposits runs nearly a quarter of a mile without a break, and limestone is found from point to point for a mile and a half, though none was observed at the Bear claim. The limestone varies a good deal in appearance, some being yellowish and other parts gray, very little being white. It is generally somewhat streaked or banded, and portions would make a good ornamental stone. Some parts are somewhat coarsely crystalline, like much of the limestone of the Grenville series in the east, but others are rather fine-grained, though none of it has the bluish gray of the Huronian limestone near Garden river or Echo bay. If met with in the Parry Sound region or the Ottawa valley, the rock would certainly be considered to belong to the Grenville series or possibly, where somewhat fine-grained and gray, to the Hastings series.

The considerable amount of banded silica associated with the deposits leaves no doubt of the age relationships. The series belongs to the Iron formation, and so occupies the upper part of the Keewatin. The associated rocks are largely green schist and porphyrite, but along the northern side of the range surface volcanics are found in the shape of a band of greenstone showing pillow structure. The schistose rocks generally have a strike of from 80° to 100°, and a steep dip, from 60° to 90°. It is probable that with more time than we could afford a series of anticlines and synclines could be worked out, disentangling the somewhat complex relationships between limestone, Iron formation and accompanying schists sketched in the foregoing pages. The rather widespread drift deposits hamper field work for the prospector and the geologist in this part of the district.

Dikes of rather fresh diabase and of older basic rock were found north of the range, but time was not available to follow them up. The Goudreau lake Iron formation is of special interest as containing probably the largest known pyrites deposits of Ontario, and also the only extensive and fairly pure limestones known to exist for hundreds of miles along the north shore of lake Sŭperior.

The Emily Gold Mine

About twelve miles east of the Bear claim is the Emily gold mine on a small western projection of Dog lake. The rocks observed along the route are green schist and greenstone, often with the pillow structure. Though the Emily mine was taken up for gold, a portion of the ore is undoubtedly Iron formation, as may be seen at the most westerly pit, where rusty or whitish banded silica dips 25° or 30° to the east, with greenstone above and green schist beneath. At the most northerly opening brecciated banded silica with sulphides and felsite is found, dipping 35° to the southeast under greenstone. The ore includes a carbonate, pyrite, pyrrhotite, and, it is said, a little free gold also. This fragment of Iron formation is of no practical importance, except as suggesting a continuation of the Goudreau lake deposits toward the east.

The Helen Iron Mine

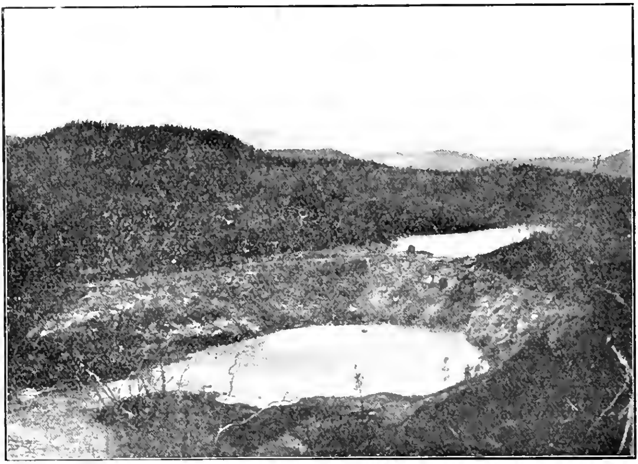
The Helen iron mine was described in some detail in 1902, from the results of work done the previous summer, and it is not intended here to cover the whole ground a second time,[5] but merely to add certain features of interest which later mining operations have disclosed. At the beginning of work on the mine lake Boyer occupied the basin west of the ore deposit, hiding everything below its surface. This pond has been pumped out and the whole basin, except a remnant stilll covered with water, is now open to study. This and the underground work in the mine itself provide much fresh information.

The character of the basin is excellently seen from below, cliffs and steep slopes of solid Iron formation rising on the north and west sides with soft clay and ochre toward the east end, and more or less talus toward the southeast. It is clearly a basin hollowed out of solid rock, the east end somewhat obscured and filled in by later deposits. The massive dam at the former outlet westward into Sayers lake consists of siderite heavily charged with pyrite and white grains of silica. The steep north wall of the basin is largely of breccia made up of small blocks of white granular silica cemented with carbonate or hematite. A dike of diabase crosses the basin from north to south near its east end, as shown by mining operations, and its outcrop on the ridge to the north of the basin can now be seen, since the ground has been cleared; but its continuation on the south side of the basin is not evident. This dike of diabase helped to cut off the eastern end of the basin, and most of the ore was deposited to the east of it, though

[5]Bur. Mines, 11th An. Rep. pp., 167, etc.

some good ore occurs to the west of the dike also. This basin 130 feet deep and a quarter of a mile long cut out of the solid rock is a puzzling phenomenon to account for. It runs across the direction of ice motion, and in any case is too deep and narrow to have been carved by glacial action. The only satisfactory solution of the problem is to be found in the theory that acid waters probably due to weathering of iron pyrites, attacked the Iron formation at a point where it had been shattered and so rendered permeable, and carried off its materials in solution. The unshattered sill to the west was much less rapidly attacked.

In the earlier account of the mine it was suggested that most of the ore deposited at the east end of the basin had been derived from impure siderite, which still rises hundreds of feet above it in Hematite mountain just beyond it to the east. Though most of the ore probably came from siderite, there is now no reason to think that



Boyer and Sayers lakes, Helen mine.

pyrites was of greater importance than was supposed when the report was written. Quite large masses of soft sandy pyrites have been found enclosed in the ore; and as sinking goes on more of these masses of pyrite occur in depth. Specimens of porous limonite with a nucleus of pyrite are often found, and every stage may be traced between nearly pure pyrite and a good quality of ore, the transition often taking place within a few inches.

The efficient mine manager, Mr. R. W. Seelye, states that the workings are 280 or 300 feet below the original level of Boyer lake, and that the ore body does not seem to narrow downwards, but tends to dip a little eastwards as if passing under the siderite hill. The quality of the ore remains about the same, running from 55.15 to 60.56 per cent of iron, .09 of sulphur and 4.32 of water. About 1,500,000 tons of ore have been mined in all, and perhaps as large an amount of similar ore remains in the mine, but the increasing number of sheets or masses of pyrite make the mining more difficult. The diamond drill shows that good ore extends 165 feet below the second level, which is 180 feet below the original surface of Boyer lake.

Along the southern margin of the ore body mucky ochre or "paint rock" marks the limit against the green schists; to the north the ore runs gradually into lean material with too much of the white silica to be worth mining, but there is no sharp boundary to the ore body in that direction.

The large masses of yellow ochre disclosed by draining operations at the east end of the old Boyer lake show that iron is still being dissolved and re-deposited as the hydrous oxide; and crusts of "lake ore" formed around stones just below lake level and as concretions of limonite in shallow water give evidence of the same action.

The series of chemical changes appears to have been elaborate and long-continued. The original rock seems to have included siderite with a percentage of silica and of pyrite, banded silica with a small amount of iron ore, and pyrite. All of these constituents may have furnished part of the ore, but at present the ore is most closely associated with pyrite. The banded silica was shattered at an early stage into a breccia, and the fragments were cemented, partly with impure siderite and perhaps later with limonite, since both cements now occur. Beside the original sandstone-like granular silica there are secondary silicious masses, dull brown jasper or chert, associated with the ore. Siderite has been dissolved and re-deposited, and silica has been dissolved and re-deposited; while sulphide and carbonate of iron have been dissolved and afterwards deposited mainly as limonite, but partly as hematite. The early stages of the formation of the ore b dy may have taken place at a considerable depth below the surface and under the action of warm water which could dissolve silica The later stages probably went on in the open and at ordinary temperatures; and similar processes are still going on on a small scale.

Post-Huronian Rocks

While in general the rocks of the Michipicoten district belong to the Archean, (the Keewatin, Huronian and Laurentian), there are in the southern part along the shore of lake Superior fringes of later rocks, including the Keweenawan and the Cambrian. The Keweenawan shows as a narrow band along the shore of the bay south of Cap Choyyé, generally as low red rocks carved by the waves, occasionally rising into a rugged hill. The best outcrop is at the mouth of a creek where a brownish red mass lifts itself almost like a pillar, leaving a gap of 50 paces between itself and the usual Keewatin schist, forming hills inland. The rock is a rather soft tuff or conglomerate made of flattened lapilli, with some white minerals between the fragments, probably formed later by circulating water. The tuff seems to dip about 30° north or northwest, but this may only represent jointage. A similar but even narrower fringe is found south of the mouth of Old Woman river, on the northern side of Cap Choyyé. No solid Keweenawan eruptive rock was observed. The bands of tuff appear to be mere remnants of a sheet which formerly rested against the Archean, and dipped downwards under the water of Superior; and the main hills and valleys of the Archean seem to have existed before the Keweenawan was formed.

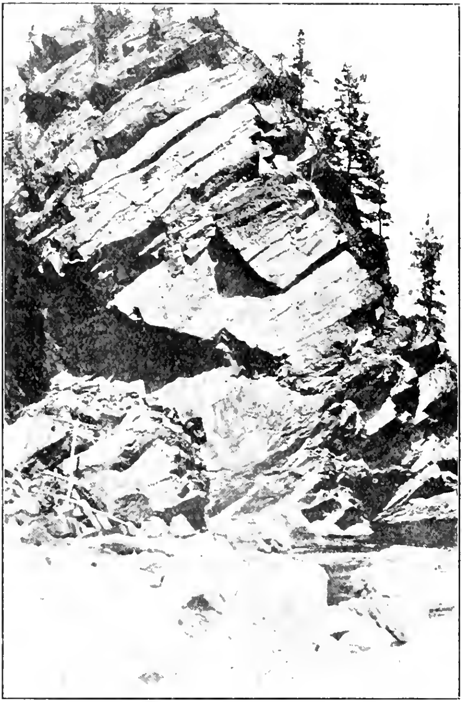
The latest rock of the region is a flat-lying sandstone just to the north of Cap Choyyé on Grindstone point. This low and flat bit of rock, perhaps a square mile in extent, is all that is left of the St. Mary's sandstone on this part of the shore of lake Superior. It forms a very striking contrast with all the other rocks, which rise as precipitous cliffs with structures more nearly vertical than horizontal; while the sandstone forms thick strata dipping beneath the lake at an angle of only 5° to 15°.

The sandstone is coarse-textured, brick red or pink or creamy in color, and some parts pass into conglomerate. It nowhere rises much above the lake, but blocks and slabs of it may be seen beneath the water stretching out for a long distance as shoals It was on this treacherous shore that the Arcadia was wrecked in a snowstorm seven

or eight years ago, and some parts of the vessel are still to be seen. The St. Mary's sandstone is generally held to belong to the Cambrian, though no fossils have yet been found in it.

Eruptives South of Michipicoten River

The Keewatin rocks of the Michipicoten district are mainly of eruptive origin, if the uppermost part, the Helen Iron formation and certain black slates associated with it, are excluded. The original eruptives have generally been greatly squeezed and



Keweenawan, near Cap Choyye.

metamorphosed, so that they now appear as schists, the basic ones as hornblende or chlorite schists, the more acid ones as felsite or sericite schists. There are however considerable outcrops of basic eruptives, perhaps of a later age, which still retain their massive appearance and often form the tops of hills; though in most cases they are so far changed that the original constituents have disappeared, and they may be classed as greenstones. They differ so little from the Gros Cap greenstones described in former reports that it is unnecessary to take them up in detail.

Of greater interest are the acid eruptives which form bosses of large dimensions and are sometimes accompanied by dikes of various kinds and of different ages. A fine example of one of these granite areas occurs on Brulé bay and harbor, forming striking reddish cliffs on the shore and rising as a group of very rugged hills inland, occupying an area of about two square miles. The granite is pale flesh-colored and of medium grain, and some stripping was done upon it years ago with the idea of opening up a quarry; but it was found that the system of joints near the harbor made it difficult to get out large dimension blocks, so that the enterprise was given up. On a hill to the northeast of the harbor the granite has much fewer joints and would furnish stones of large dimensions.

Thin sections show an unusually large amount of plagioclase (near oligoclase) equalling in amount the orthoclase, so that the rock should perhaps be called granodiorite. Penetrating the main body of granite are a few irregular pegmatite masses and also well defined dikes of later fine-grained granite and of what appears to be felsite. Thin sections show that both have the same composition as the main granite mass, but are of finer grain.

A still later set of dikes of a curious kind penetrates all phases of the granite in various places, especially near the landing place in Brulé harbor. The rock shows very rusty, weathered surfaces, but fresher material is easily got below the surface. The color varies from pale buff to dark gray, often with a slightly porphyritic look, and the dikes vary in width from a few inches to a few feet. Under the hammer the rock breaks with a conchoidal fracture. Sections vary a good deal in appearance, but all are unfortunately badly decomposed so that few of the original minerals remain. In the best sections brown biotite is distinct, and many square crystals of magnetite, while olivine is represented by its crystal outlines filled in with a carbonate and often also serpentine. No plagioclase could be recognized, but short turbid prisms may have been plagioclase originally. The most completely weathered sections show only a confused mass of carbonates with some quartz and numerous crystals of magnetite.

Comparing them with thin sections of biotite picrite from Magpie river and other points to the north it is found that the two rocks are probably the same, though the Brulé harbor specimens are more completely weathered. A dike of dark gray eruptive rock from Barton's claim north of the Mission was found to be the same, so that this somewhat rare basic rock is evidently widely distributed in the Michipicoten region.[6]

Other granite bosses or broad dikes were observed in several parts of the region, but none have been studied or mapped in detail. A granitic looking rock from the northeast arm of lake Mijinnemungshing, running for a short distance as a broad dike, deserves separate mention however. It is dark flesh-red in color with some black mineral in comparatively small amounts, but the feldspars, which make up the bulk of the rock, are in broad laths or narrow plates instead of having equal diameters.

Thin sections show that the rock consists mainly of orthoclase, often turbid with iron oxide, a little broadly twinned plagioclase and still less of the dark minerals, which are largely wedged into corners between the feldspar plates. Ruddy brown mica, dark green hornblende and clear augite make up the dark ingredients. The rock is clearly a syenite with a suggestion of monzonite, but no nepheline rocks were found in its neighborhood, as so often happens with the monzonite group.

Schistose Rocks of the Region

As the pale and dark green schists of the Wawa tuffs and Gros Cap greenstones have been somewhat fully described by myself and Dr. Bell in former reports, it has not been thought necessary to examine many of the schistose rocks microscopically; but two were of considerable interest and may be referred to here.

6Bur. Mines, 1903, p. 179.

The crystalline limestones of the Goudreau lake region, associated with pyrite deposits and banded silica, attracted attention as the only limestones of any extent north of lake Superior. In hand specimens they are medium-grained rocks, pale gray or brown or white in color, sometimes streaked with schist or pyrites. Thin sections show mainly calcite of the usual kind, with characteristic rhombohedral cleavages and many twin lamellae. Scattered through the calcite are a few grains of quartz, pyrite, and green hornblende.

At the Bear claim, in the same region as the limestone, a gray rock, speckled white and dark green or black, having the look of a somewhat schistose diorite, turns out to be ottrelite schist, a rather rare species of rock. Thin sections consist of a fine-grained ground mass, of quartz, some carbonate, and a little magentite, in which are scattered many large masses of ottrelite, a mineral belonging to the group of chlorites, but at first glance suggesting hornblende. Cross sections are dark green, and show little change from light to dark between crossed nicols, while length sections, which have prismatic shapes with jagged, irregular ends, are quite strongly doubly refractive, displaying a fine lamellar twin structure. The mineral has a rather strong pleochroism, pale yellowish brown, green, and green blue. The crystals sometimes enclose a rough, hour-glass shaped, arrangement of darker, nearly opaque, material.

PLEISTOCENE GEOLOGY

Glacial Features

The Pleistocene of the north shore of lake Superior has attracted much attention because of its magnificent raised beaches rising at various points for hundreds of feet above the present lake. The glacial deposits which in some places underlie the terraces, and which have furnished much of the materials of the beaches have been less carefully studied. During the past summer morainic materials have been found at many points, especially above the lower and more widely spread terraces. In the region south of Michipicoten river many of the portage paths from lake to lake are across moraines, the lakes themselves being due to the blocking of the valley by morainic deposits. This is true of the paths between Summit, Bear, Pickerel, Trout and Mijinnemungshing lakes; and around several of the lakes morainic hills rise as prominent ridges.

In parts of the country where there are few lakes, as on the road between Michipicoten falls and lake Anjigomi, or the road southeast from Brulé harbor to the iron range west of Mijinnemungshing, the route often leads over bouldery hills, evidently morainic, and in general the boulder clay is overgrown with maple, often in respectable groves. Seeing a slope or hill covered with maple one may almost be sure of finding a moraine or a rolling surface of boulder clay. The other types of glacial deposit, drumlins, kames and eskers seem to occur seldom, though the portage from Pickerel lake to Trout lake runs for some distance along an esker.

In the northern part of the region morainic ridges are found also, as on the Grasett road north of the Josephine railway and near the Half Way house; but instead of clay there is more often sand as the matrix of the boulders. The portages along Michipicoten river above the falls are largely over moraines, as at Pigeon rapid and the "Big Stony" portage between Dog lake and Manitowick lake. Along the trail from Goudreau lake to Emily mine on Dog lake, morainic hills are crossed and some small kettle valleys may be seen.

Near Goudreau lake and McVeagh's creek there are what may be called glaciolacustrine deposits, "pitted plains" evidently laid down in great lakes at the margin of the ice, blocks of which were buried under sand and gravel, and afterwards slowly melted, leaving basins. The basins commonly contain a lake or pond, sometimes with no outlet but seepage through some permeable layer. Occasionally the pond has been drained and the basin encloses only a bit of marsh.

Ice-carved rock surfaces are to be found on most hills, and are often very well shown along the shore of lake Superior. The rocky hills rising above Michipicoten harbor are well-rounded and smoothed.

While the rock surfaces have almost everywhere been well scoured, there is one point near Hawk lake where a railway cutting shows very angular stones of all sizes, seeming to pass into broken, and then solid, rock (granite). If the inference is correct that this surface is unglaciated, it must have been well protected from the onset of the ice which has worked so effectively on all the hills around. There is a somewhat similar instance of an apparently unglaciated surface on the south side of one of the Slate islands near the north shore of lake Superior. There too the solid rock seems to pass up into more and more weathered fragments without stones of distant origin. How these exceptions are to be accounted for in a region intensely glaciated all around is not easy to explain.

Old Lake Deposits

In almost all parts of the region old delta deposits, gravel bars and shore terraces are found rising often at several levels in succession up to 350 or 400 feet above lake Superior, and sometimes much higher. These deposits are naturally best marked near the bays along the shore of lake Superior and along the river valleys inland from the bays; but they may often be seen in the interior more or less surrounded by hills, where the surface is low enough, and where drift materials were at hand to provide sand and gravel to be worked upon by the waves or to be spread out by rivers. A large portion of the surface between the hills consists of nearly flat sand or gravel or rounded stones, and a smaller part at lower levels is covered with silt or stratified clay.

Terraces on the north shore of lake Superior have been noted from the time of Agassiz' first visit to the present, the most complete account of them having been given by Dr. Lawson;[7] and by geologists of the Bureau of Mines of Ontario.[8] Tables are given in these reports by which the elevations along different parts of the north shore may be compared.

During the past summer a number of terraces were fixed by hand level from lake Superior or bench marks of the Algoma Central railway, and many others were determined by aneroid. For long excursions inland the latter method was necessarily used, but in changeable weather the results afforded are by no means accurate. The highest terrace determined accurately from a bench mark was near Goudreau lake at 728 feet above Superior, not as high as former aneroid levels obtained near Pokay lake on Dog river[9]; which gave 843 feet above Superior. The 728-feet terrace is well formed and no doubt represents a water level. It and the Pokay lake terraces are of special interest since they rise 240 feet or more above the divide between Dog lake and the Hudson bay waters (490 feet above Superior). Unless these terraces were made in an ice dammed lake the sea must have extended quite round from James bay to the basin of the Great Lakes and the St. Lawrence, with a strait having depth of 240 feet. What body of water formed the highest beaches has never been clearly settled, but it must have been some very early stage of lake Warren, while the northeast part of the continent was still deeply depressed by its load of ice.

Wave Beaches on Lake Superior

There was opportunity while working along the shore of lake Superior to examine somewhat carefully the splendid wave beaches near Brulé harbor, and these may be described as typical. Rugged hills of granite cut off the land-locked harbor from the next bay to the south, at the entrance of Old Woman river, and the best exposures of the beaches may be found along the trail connecting the two bays.

[7]Geol. & Nat. Hist. Sur., Minn. 20 Ann. Rep., p. 287. [8]1899; pp. 153-3, and 1900, 175, etc.
[9]Ibid, 1900, p. 176.

Beginning on the shore north of the sand and gravel bar at the mouth of Old Woman river, one finds that the present beach consists of well rounded stones larger than a man's head. The stones are clean up to ten feet above the present lake level, evidently the highest to which wave action reaches in the fairly well sheltered bay. Above this comes beach after beach of exactly similar stones, each rising a few feet above the last, to a level 34 feet above the lake, when there is an interruption in the succession. All the stones above the present beach are lichen covered and have evidently rested unmoved since the water sank. At various levels there are logs and bits of timber on the succession of beaches, the lowest ones, on the present beach, fresh and clean and with many marks of man's work, the upper ones rotten dried up trunks and stumps that seem to be decaying where the waves left them. On the highest part of the group of beaches above 21 feet, bushes and trees are beginning to cover the stones and a certain amount of soil fills the spaces between them.

Continuing along the trail through the woods, no distinct beach is seen up to 85 feet, when a second group of lichen covered boulder beaches commences, running with no marked break up to 148 feet, the last two levels consisting of gravel rather than boulders, however. After a gap boulder beaches begin again at 212 feet and go up to 256 feet, above which, at 265 feet, there is a gravel bar connecting two rocky hills a quarter of a mile apart. This is the divide between the two bays. Descending toward Brulé bay gravel terraces come at various levels which correspond roughly to the beaches described. The two rugged granite hills rising above the beaches have greatly checked and jointed cliffs, falling by frost action into small blocks, which seem to have provided most of the material for the rounded boulders and gravel.

The three successions of boulder and gravel beaches, as shown in the following table, probably represent stages of water corresponding to some definite level of outlet, but whether they should be referred to old lakes Nipissing and Algonquin as hitherto defined does not seem quite clear. The lowest series may correspond to Taylor's Sault beach.

BEACHES NORTH OF OLD WOMAN RIVER

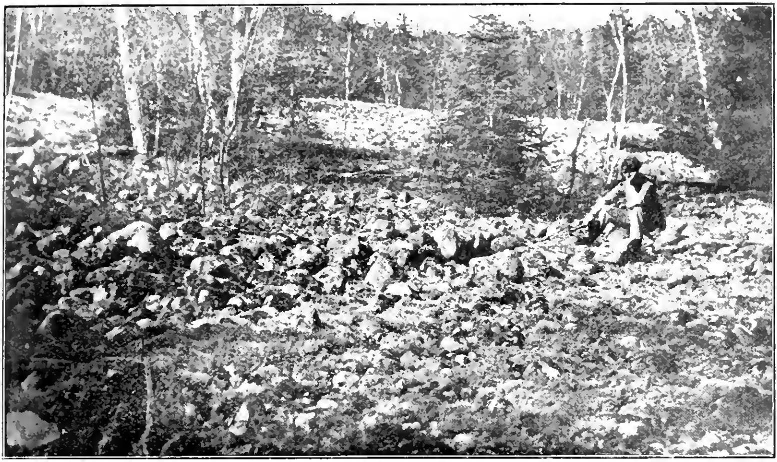
	Feet	
Gravel beach	265	"Algonquin Beaches"
Boulder beach	256	
" "	240	
" "	222	
" "	212	
Gravel beach	148	"Nipissing Beaches" or Algonquin?
Boulder beach	133	
" " lichen covered	126	
" " " "	106	
" " " "	85	
" " " "	34	Sault Beaches?
" " " "	24	
" " " " (drift wood)	21	
" " of clean stones	10	
Lake Superior	0	

Going inland southeast from Old Woman river wave-built terraces are found up to 180 feet, and beyond this sand and gravel terraces, perhaps of delta formation, up to 315 feet. Some miles inland there are broad gravel flats or bouldery terraces at 534 and 543 feet. The last water levels must belong to lake Warren.

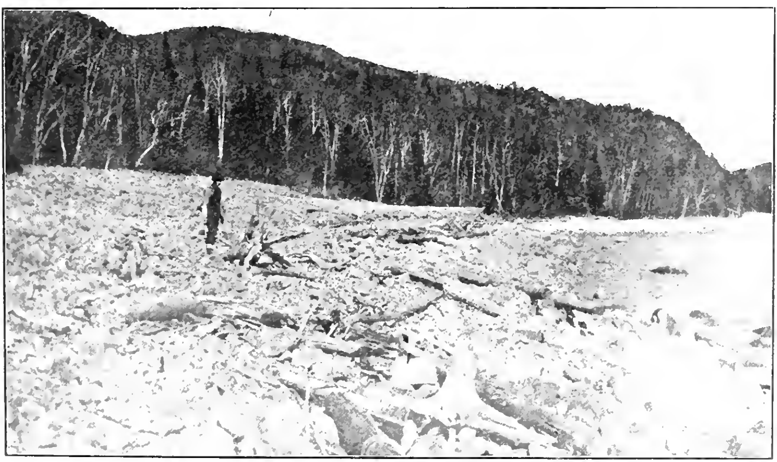
Terraces near Michipicoten

The fine terraces rising northeast of Michipicoten harbor and the Mission have been referred to several times in former reports, and do not require much further description.[10]

[10] Bur. Mines, 1899, p. 154, etc.



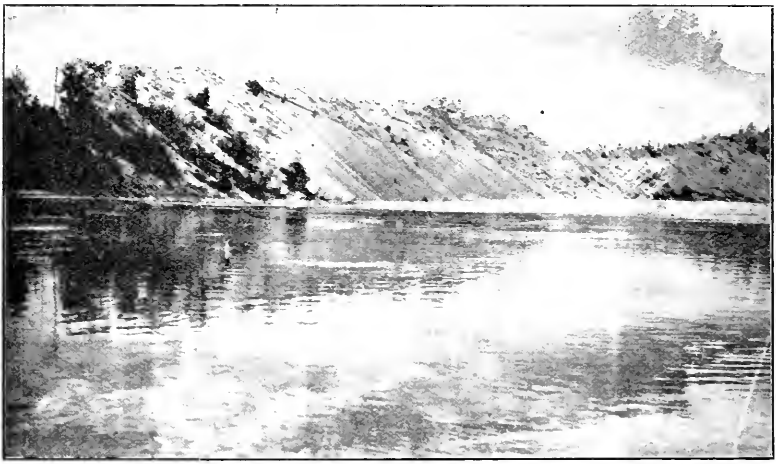
Raised beach, Old Woman river.



Raised beach, Old Woman river.

The region just mentioned has been fairly inundated with the delta deposits of Michipicoten river and its large tributary, Magpie river; so that the rocky hills rise island-like above the gravel plains. On the road from the Mission north to Wawa terraces or wave-built sand ridges are found at levels of 23, 29, 54, 79, 85, 90, 92, 100, 130 and 208 feet in the first two miles. Nearer Wawa there are higher terraces up to 365 feet above lake Superior, the last gravel ridge forming the barrier of Wawa lake itself and rising 27 feet above it. Wawa lake must have been a fine bay of lake Warren until ultimately cut off by a bar. It is said to be 150 feet deep at the deepest point, and to average 80 feet in depth. Inland from lake Wawa, along the canoe route to Manitowick, terraces rise to 440 feet.

The railway from Michipicoten harbor to the Helen and Josephine mines cuts numerous gravel terraces near Magpie river, the best marked being 70, 170, 210, 364 and 383 feet respectively above lake Superior. In several cases, as at Trembly station, there are broad sand and gravel plains, and railway cuttings on both sides of the Magpie valley display 50 or 100 feet in thickness of delta materials.



Terrace, Michipicoten river.

On the Josephine branch railway, north of Helen mine, sand plains are found up to 479 feet, and these run, with some interruptions, for about 20 miles along the Grasett road, which follows the Magpie valley.

Along the Michipicoten valley terraces occur as far as the falls, in the form of wide plains which extend for miles to the north and south. The river cuttings display excellent sections of the delta, the highest observed reaching 135 feet. Near the level of the water there is generally some stratified clay, but almost all the rest of the section is of moderately coarse sand, with a few thin gravel layers and a clayey seam half way up. There are no indications of unconformity in the 135-feet section, and it is probable that the lower terraces have been carved from the highest ones by the meandering of the river as its base level sank with the lowering of the great lakes into which it flowed. In some of the sections exposed along the lower part of the river, there is very extensive cross bedding directed lakewards (southwest), probably formed as the delta grew outward into deep water.

The most interesting section is about three miles up the winding river from the Mission, where a log of wood projects 20 feet straight out from the middle of the bank, and smaller logs and sticks with peaty matter are crowded into the lower part of the section, which is as follows:

Stratified sand with some gravel	20 feet.
Peaty clay with silty sand	8 "
Hard blue clay, apparently unstratified	2 "

The section varies up stream beyond a projecting point of rock, where one finds ten feet of finely laminated clay without leaves or wood below the stratified sand. The materials of the section showing the logs were probably laid down in a small separate basin or channel when the water was not much higher than in lake Superior at present, for the river at this point cannot be more than five or at most ten feet above the lake. At what stage of the glacial or post-glacial history of the region this took place is

Projecting log from peaty deposit, Michipicoten river.

uncertain; though the fact that clay is found at the bottom of many sections of the lake deposits of Michipicoten, and never in any quantity higher up, makes it fairly certain that the clay is the oldest of the pleistocene deposits.

It is generally assumed that the post-glacial lakes began with water dammed to the highest level, and from time to time sank as the outlet was lowered and the rising of the land to the northeast increased. It is hardly possible however that these woody and peaty clays could have been laid down miles from shore in a lake rising hundreds of feet above the little basin. Instead one can hardly avoid thinking that the matted but fairly well preserved leaves and bark and cones were left in some shallow pool or sluggish stream before the sand delta began. It is however just possible that this deposit is later than the terraces above and below it along the river, and that it was formed during one of the later stages of the water, such as Great Lake Nipissing, or the stage which formed the Sault series of beaches. The stratified sand above the clay is just like the beds making up all the higher terraces along the river, one of which rises to 72 feet a short distance in the rear of the section just described. It is far more probable

that the plant bed was there before the delta sand was spread out, which means that it is in some sense inter-glacial. The absence of boulder clay above the plant beds may perhaps be accounted for by later erosion, though there is no direct evidence of that.

The large projecting log is of fairly well preserved white pine, and an expert lumber man tells me that the fragments of other logs collected in the deposit include jack pine, balsam, cedar, white and black spruce and poplar. The peaty material contains many deciduous leaves, pine and spruce needles, cedar leaves, scales of cones, bits of birch bark, and a very few mosses. There are a few bits of charcoal, proving forest fires. The trees indicate a climate about the same as at present,—cool temperate. The logs of wood are not much flattened by pressure, and have undergone scarcely any change towards lignite, points in which they differ from the inter-glacial formation at Toronto. The large pine log has been known to the Indians for 40 years. For the present the age of these interesting plant remains must be left doubtful.

Terraces above Michipicoten Falls

Along the roads leading northeastward and eastward from the Mission numerous higher terraces are found, whose elevations unfortunately are not very definitely fixed, owing to great variations of weather at the time of our excursions to them. Our readings give terraces at 269, 314, 339 and 404 feet above Superior in the neighborhood of the falls. South of this near lake Anjigomi some equivalent terraces were measured from bench marks on the Algoma Central railway, so that they are fairly accurate. They run from a silty plain along Anjigomi river at 387 to 415, 442, 462, 481 and 498 feet above lake Superior. The two highest are bouldery gravel flats rising to the east of lake Anjigomi, now more or less cut into by streams flowing into the lake.

Fine terraces occur in succession near the Mauxman mine a mile or two northwest of Michipicoten falls, well exposed since the wood cutters for the mine have removed the woods. Wave-built ridges facing southwest with lagoons between occur at several levels, made by aneroid 332, 378, 400 and 450 (?) feet.

Highest Terraces in the Region

The highest terraces in the region were observed along Hawk lake, McVeagh's creek, and the series of small lakes between the north end of McVeagh's creek and Dog lake. Here fortunately several benchmarks on the route of the railway furnished good starting points for measurement, so that the levels given must be nearly correct. The northeast end of Hawk lake is enclosed by flat sand plains rising from 6 or 8 to 50 feet above the water, which the railway levels put at 430 feet. McVeagh creek rises rather rapidly towards the north as one ascends it, with sand terraces at various levels up to 567 and 590 feet. North of Goudreau lake and immediately above a bench mark is a well defined terrace at 728 feet, the highest measured by hand level from a fixed point. This and other gravel flats must have been formed in the highest of the glacial lakes at the margin of the retreating ice, for several of the ponds of the region are typical kettles, some with no visible outlet. About 20 miles to the east is the low divide between Dog lake and the Hudson bay waters, rising only about 1,090 feet above the sea, or 490 feet above lake Superior. The terrace just mentioned stands 238 feet above the pass towards Hudson bay.

Dr. Lawson's highest recorded terrace near this end of lake Superior is only 455 feet, and the highest terrace given in his table reaches only 607 feet. His work was done along the shore of lake Superior, however; and the highest beaches are inland toward the Hudson bay watershed.

If we assume that all our higher beaches belong to different stages of lake Warren, and this seems the most natural supposition, between Goudreau lake and the outlet at the present Chicago drainage canal there is a difference of 728 feet, or say 750 feet, allowing for the depth of the river draining lake Warren into the Mississippi. As the two points are about 470 miles apart this gives a differential elevation in a direction 15° east of north of a little more than 1½ feet per mile. This is not at all an impossible shifting of level since the Ice Age.

Terraces along the Algoma Central Railway

Going north from the Sault one is struck by the succession of levels presented, first clay flats, then sand plains, and finally gravel beaches. The terraces in the town itself have often been referred to and need not be mentioned again. The lower clay and sand represent probably deposits in moderately deep water, while the gravel plains are delta deposits at about the level of the old lake, and the gravel bars show wave work often rising slightly above the old lake. Only well defined terraces representing distinct water levels will be referred to here. The levels are mainly taken from the railway profile.

Along the road running north of the town there is about two miles out a gravel bar at a small cemetery, the first clear evidence of wave work, at 198 feet above Superior (aneroid), and probably the same water level is found as the rear of a terrace near mile 5 on the railway (200). Below this level a broad flat strewn with boulders indicates long wave action. At mile 6 there are bars at about 250, at 7½ a terrace at 330 feet, and at mile 8 one at 355 feet, all wave-built structures.

At mile 9½ a new series seems to begin near a granite quarry at 417 feet; while at Aweres station (mile 12) there is a gravel terrace at 450, and another at Hayden, 470 feet. Crossing a rocky ridge there are gravel bars farther north near mile 20½ rising to about 480 feet, the highest level noted in our journey, which did not cover the highest part of the line towards Montreal river.

Other determinations of beach levels in the region may be found in Lawson's work[11] and in former reports of the Bureau of Mines.[12]

Old Water Levels on St. Joseph Island

A spare day was spent in a run over St. Joseph's island to the southeast of the Sault. The island is largely covered with boulder clay and other drift deposits and several terraces occur at various levels. A shore cliff cut in clay is found not far from Richard's landing at 654 feet above sea or 62 feet above lake Huron. Farther inland there is a gravel flat at 156 feet, and one or two lower ones just to the north. Another bar occurs at 172 feet. Boulder pavements and sand or gravel bars occur some miles to the east at 240 and 250 feet, and a very good bar is found 6 miles south of Richard's landing, at a cross roads near a church. This rises 295 feet above lake Huron, and is the highest water level observed on the island. As there is sandy or clayey morainic material rising to the south, forming a shore cliff, higher beaches might have left their mark.

Near Hilton, a port about the middle of the island on the north side, there are several terraces, one rising 65 feet above lake Huron. Mr. Fremlin of Hilton has found shells in sand 90 feet below the surface, starting about 150 feet above the lake; but none of them were preserved.

North of lake Huron terraces rise much higher than any encountered on St. Joseph's island, but the short time at my disposal and the wooded character of the higher parts of the island make the working out of beaches difficult. Certain dome-like hills in sight toward the south are said to consist of limestone, and so would not be very favorable for beach construction.

[11] Geol. Nat. Hist. Sur., Minn., 20th An. Rep., p. 286. [12] 1899, part II, p. 153

ADDITIONAL NOTES

On the Iron Ranges of Eastern Michipicoten

BY E S MOORE

The Director of the Bureau of Mines sent the writer instructions to assist Dr. A. P. Coleman in the Michipicoten Mining Division and carry on the work after he should leave for Africa. The field was reached on the first of July, and when Dr. Coleman left the field a few days later, the writer took charge of his party and continued the work of exploring the iron ranges in that region.

As many of the more important ranges had already been visited, much of our work necessarily consisted in completing the map of the region already begun, in looking up isolated patches of iron range of which we heard from time to time, and in studying the general geology of the district.

Mr. T. L. Goldie, B.A., who had already spent some time with Dr. Coleman, continued in the field and rendered efficient service in the topographical work. Besides Mr. Goldie and the writer, the party included three Indian canoemen and packers who were familiar with the region and could act as guides.

Making Michipicoten River village its headquarters our party worked largely along the chain of lakes to the southeast of the village, and thence northeast towards Missinabie station on the Canadian Pacific railway.

Thanks are due for many favors and much assistance to a number of people in the region who kindly furnished information and aided in many ways in our work.

The Field of Work

The Michipicoten district has been so frequently mentioned in connection with the iron mining industry, paper manufacturing and railway development, and its very interesting geological features have so often been described, that one feels as if the region should be familiar to the general reader.

Leaving Michipicoten River village we travelled up the river of the same name as far as the first large bend. The region is covered with sand terraces, but in the distance one can see numerous green hills rising on every side. A portage leads southeast from this bend in the river over a sandy plain to the hills, among which lay the first small lake of this chain. The hills are not very high, and are composed of green schist which is generally found dipping at a very high angle. During the remainder of our trip over this chain around by Pickerel and Anjigomi lakes and back to Michipicoten River, we found nothing but hill, lake and forest.

The country is literally covered with lakes. In some cases there are only a few paces from one to the other, and the longest portage, that between Centre lake and Great lake is not more than three miles. It would be hard to surpass part of the region in beautiful scenery, and the view enjoyed from the top of some of the highest hills rewards one for the ascent.

The timber is mostly small, consisting largely of cedar, spruce and white birch, with scarcely any large pine, unless it be a little which once grew along the Michipicoten river, but which has already been cut. In some places there is a growth of small maple timber.

A few of the lakes, such as Reed lake, are conspicuous for their beautiful, white water lilies. Deer, moose, duck, partridge, rabbits and fish abound in the southern region, along with some wolves and a few caribou. In the northern brulé region where small fruits, as raspberries and blueberries are plentiful, the bear is quite common.

There are few rivers of importance, the Michipicoten being the only large stream in the region explored. One wonders for what the country can be utilized, unless many mines are discovered. Very little of it is level enough for farming, as there is hill after hill as far as the eye can reach, rising along Summit lake and Great lake to a height of two hundred and twenty-five feet, while along the north side of Pickerel lake the granite cliffs are five hundred feet high.

There is considerable moraine around Pickerel lake, where the morainic hills are from ten to seventy-five feet high. They reach a much greater height between this and Anjigomi lake, where on the shores of the latter they rise to one hundred and twenty-five feet.

There is much sandy plain around Michipicoten River village, and towards Wawa city. So, too, on the portage between Wawa and Hawk lakes. But north of Hawk lake the hills are high and rough. On the northwest corner of lake Manitowick the hills are as much as six hundred feet higher than the lake, and the pink and flesh color of the granite hills mixed with the darker greenstone makes this lake one of the most charming of any of the lakes of the region.

Indians, Missanabie.

One concludes from a survey of the country that there is almost an inexhaustible supply of pulp-wood and charcoal material, and that there will be no lack of power for manufacturing and mining purposes, as there are numerous falls and rapids on the rivers of the region. A power house is at present being erected at Michipicoten Falls, on the river of the same name, and there are sites for many more. The Magpie, for instance, has a splendid fall for power development near its mouth.

Wawa City to Missanabie Station

As so many tourists travel the route between Michipicoten Harbor and Missanabie station, on the main line of the C. P. R., it may be well to speak more particularly of the canoe route.

The portages from Wawa to Hawk lake are easily followed, and are mostly over a sandy plain in which are five small morainic lakes, some of them beautifully clear. Hawk river has several rapids, but there is only one requiring a long portage. Manitowick is a very dangerous lake for small canoes, because it is subject to bad and sudden storms; the waves running extremely high, and the shores in several places so steep as to make landing difficult.

Returning from Missanabie the trip down the Michipicoten river is a pleasant one. Though there are several short portages around rapids, and one long one,—about two miles, around the high falls and rapids below,—the current is strong nearly all the way and paddling is easy. The scenery is very fine, and fish are plentiful

Michipicoten Schists

These form a series of hills extending from Pike lake southeast nearly to Great lake, where the granite begins; they reappear on the northeastern part of Anjigomi lake, and again near the northeastern part of lake Manitowick and southern part of Dog lake. They vary in color from a quite dark speckled rock more or less massive through yellowish schists containing carbonates to light green, slaty chlorite-schists.

On Pike lake the rock in some places is fairly massive, dark green and bears some pyrite. It is probably closely related to the Gros Cap greenstone, and weathers to a greenish chloritic rock.

On Round lake the rock is very schistose with a dip of nearly ninety degrees, and strike northwest. On one point a yellow carbonate and oxide of iron occur in small quantity

On Peter's lake there are found greatly weathered diabases and some quartz porphyry, and on Island lake and part of surrounding region there is a rock which is fine grained and green and under the microscope has the appearance of ash rock, though it is so weathered as to be scarcely recognizable. Thus the rock in this region would correspond very closely to the Wawa tuffs mentioned by Professors Coleman and Willmott.

On Centre lake the rock is much the same, and the writer observed some uncertain indications of bedding. Between this lake and Hilltop lake there is some very light green chlorite schist approaching a slate in appearance. The strike is 155°, and the dip varies from forty-five northeast, to ninety degrees. On Great lake and Bottle lake we find small masses of greenstone greatly weathered, and carried off eruptively by the granite.

On the north shore of lake Mishewawa there is hornblende schist a dark rock consisting only of quartz and hornblende.

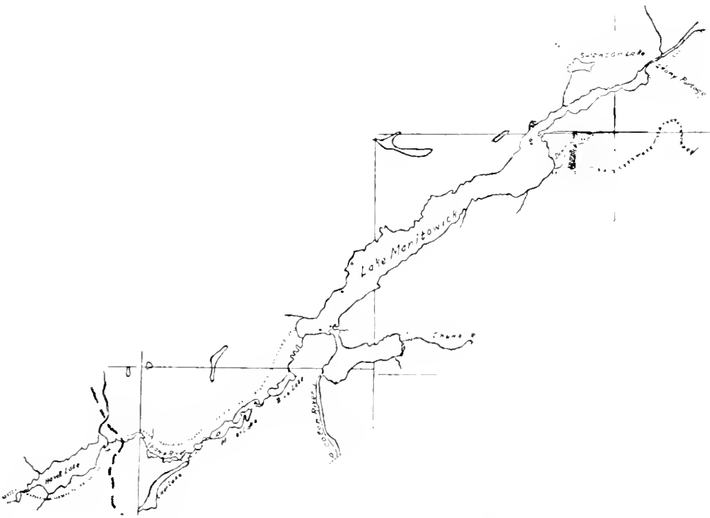
The rock of the same series on the eastern side of lake Anjigomi at the northern end of the narrows is very similar to that on Round lake. It bears some traces of iron ores, has a dip of about ninety degrees, and a strike of 163°. Mixed with the schist are some distinct diabases

Along the northeastern end of lake Manitowick we again find these schists carrying streaks of iron ore. On the northeast shore of the large expansion of the lake the rocks vary quickly from massive to a very schistose structure. The strike here is almost east and west and the dip varies from 45° to 70° north. The rock is greatly shattered, and is lined by numerous quartz veins, some of which pass into a granular form of silica and contain traces of iron ores. There is a narrow band of iron-bearing rock about

two feet wide and a mile long, extending along the north shore of the lake. At the beginning of the narrows the strike suddenly changes to north and south, or in a direction at right angles to its former strike, with a dip of 30° to 45° to the east.

On the southern end of Dog lake the rock is partly schistose and partly massive. It is greatly weathered and has a strike of 160° and vertical dip. This continues north as far as the large island on Dog lake, where the granite begins, and on Rabbit island we have the typical Laurentian granite and greenstone.

It appears from observation that these schists have been thrown into immense folds by the eruption of the later granites, and the anticlines of these folds have largely disappeared through weathering so that what remains of the schists stands nearly vertical, nipped in between the masses of granite. The bands of iron ore, which occur



Map of Hawk and Manitowick lakes. Scale, 6 miles — 1 inch. Iron formation ▌.

in these schists, though in small quantity, show a very close relation in genesis between the Helen formation and these schists. As these masses of ore occur in regions where the rock is very schistose, where the squeezing has been greatest, and are parallel to the schistosity of the rock, the pressure in forming the schists must have also affected the concentration of the ore and the weathering of the original minerals.

There seems to be little doubt that the ore has been formed by the deposition of compounds from solutions. If this be the case, the dip of the rocks at present must represent the planes of original bedding, and the schistosity of the rocks must be due to the lateral pressure on the rocks after they were folded, because the planes of schistosity will naturally be formed at right angles to the direction of the force causing them

Helen Iron Formation

This formation is widely distributed in the region. Many masses of it were found, but they were mostly either too small or too lean in concentrated ores of iron to make them of economic importance.

The first outcrop visited is north of Peter's lake. This mass is about three hundred and fifty yards long, but not more than twenty yards wide at any place, and it narrows towards both ends. The dip is vertical and the general strike 105°, while the rock is greatly twisted, forming in some cases complete ovals. This contortion is no doubt largely due to the presence of a mass of granite close to the range. There is some typical banded silica which varies to a quartzite, more or less stained by iron oxides. There is also a quantity of blue quartz in the range rock. The contact rock is schistose diabase.

Near the southwest end of Peter's lake a small patch is seen, also in contact with diabase, showing large crystal cleavage surfaces, when broken.

On Junction lake near the portage there is a mass some two hundred paces long and ninety wide at the widest point, showing the typical banded silica running out into a coarse quartzite. It is more or less mixed with greenstone. which seemed to cover it in one part. and disappears into a large swamp at one end. There are some small scraps on the lake lying between Junction and Cross lakes, but these are not of importance.

It was reported that a considerable iron property lay just southeast of the northern end of Loonskin lake. This was visited, and though the range rock extended a distance of at least three hundred and seventy-five paces in one direction and two hundred in another, the rock was much mixed with greenstone, which appeared to be all through it. The rock varied from banded silica and magnetite, through greatly weathered carbonates, to almost pure quartz. The dip varied from forty-five degrees northwest, to vertical.

A narrow seam of carbonate and oxides of iron lies along the edge of the northwest side of lake Manitowick. It is about one mile long and maintains a regular width of two or three feet. Several small masses are found in the region, the continuations of those on the northwest shore being found across the lake on the east shore, where the strike is at right angles to the former.

Search had been made some years before by geologists for a mass of iron range said to be to the east of the large bay near the narrow part of lake Manitowick. An outcrop was found extending over a large area, but the rock carried little iron and is unimportant. The conditions are favorable for a concentration of iron ore in this immediate vicinity. and one would look for such if a large quantity of the iron range rock should ever be discovered.

A quarter of a mile from the west end of lake Mishewawa there is a band of iron range rock, a continuation of the band which Dr. Coleman had already examined for some distance. The strike is directly northwest, and the dip ninety degrees. It holds an average width of about one-quarter of a mile, cutting across the country to the Magpie river. It crosses the Michipicoten river just below the High Falls and passes the Mission in Simon's hill just north of the village. Some parts show little iron, while in others banded silica and carbonates are found. On the small lake just northwest of Mishewawa there are evidences of great squeezing, and the rock has the appearance of cross bedding. It is closely associated with some felsite-schists below the falls.

Among other small masses of the range examined were one on the "tote" road from the Mission to Great lake, and one known as Ganley's claim directly inland from the mouth of Noisy river at lake Superior. Although this had four distinct claim stakes guarding it there was nothing exceptional about it unless it be the presence of more sulphides than are usually found, the principal one being pyrite.

The Keweenawan Series; Basic Eruptives

The representatives of this series in the region include diabase, diorite and norite. These rocks are generally found as distinct dikes or as irregular masses cutting the earlier rocks.

On Peter's lake a mass of diabase showing large flat crystal faces is found in contact with the Helen formation, and a similar occurrence is found farther north.

On the portage from Centre to Great lake and near the latter, the path follows a stream running along a dike of diabase cutting through the granite, and extending out into the lake. This dike has largely weathered away. Between Great lake and Bottle lake a mass of very fresh diabase is found, and there are many similar intrusions of this rock, but with no striking characteristics.

The diorite is more rare in this district, but a fine mass of typical diorite is found on the northwest corner of lake Manitowick. It forms a huge irregular mass rising about six hundred feet above the lake and extending a considerable distance to the northwest, while towards the southeast it runs out into the lake, cutting through the granite as a distinct dike about two hundred and fifty yards wide. It is a coarse, dark green and white speckled rock, weathered with large brown crystal surfaces.

The masses of norite found in the district are interesting on account of being the only examples of this rock of which the writer has heard.

On Reed lake at the southwest corner there is a mass of granite one hundred feet higher than the lake, and on the side of this hill is a speckled green and white rock which under the microscope shows quartz in small quantity, much plagioclase and hypersthene and some augite. This composition is that of norite.

On the portage between Fisher and Bear lakes a dark green speckled rock was found, containing quartz, plagioclase, hornblende, some rhombic augite and much magnetite. This composition would indicate a rock similar to norite, though it might be placed with the weathered gabbros.

No other specimens of this rock were discovered unless it be a small mass which lies near the Manxman mine and which in the hand specimen quite resembles the norite of the Sudbury reigon. Mr. A. Gibson, who was there at the time of my visit, informed me that the rock on analysis was found to contain some cobalt and nickel. There was much blue quartz in the rock around the mine. The writer has not had any microscopic sections made of this mass, so cannot speak more definitely in regard to it.

Post-Lower Huronian Granites

These granites cover large areas in the region, and are undoubtedly later than all the other rocks except the basic eruptives. They have risen under and through the Keewatin rocks, throwing them into large folds, and no better example of the action of these rocks on the older schists is seen than on the northern end of lake Manitowick. where the masses of granite to the southwest, south, and northeast have combined to fold some of the schists in a direction at right angles to the others.

These rocks are quite typical in composition and color, varying from flesh red to dark gray. depending upon the excess of orthoclase and hornblende or biotite.

Following the route already mentioned, from Pike lake to Anjigomi, the granite begins near Great lake, continuing through to Anjigomi, and west to lake Superior. It is to some extent mixed with greenstone, and in one case the writer observed a small mass of Helen iron rock carried off eruptively.

There is nothing exceptional in the granite until we reach lake Anjigomi, where there is a large mass of granite near the west end of the narrows, varying considerably in color. Its composition, as shown by the microscope, is quartz, plagioclase, orthoclase, epidote and muscovite, so we might properly apply to it the name grano-diorite.

On Hawk lake the granite is very coarse, and the writer observed hornblende crystals as much as two inches in length. In this region it is largely mixed with greenstone. It has not much of the gneissic structure except in a few places such as on a hill about three hundred feet high just north of Hawk river. It forms a contact with the schistose greenstone about half way up lake Manitowick, and the contact and folding of the rocks here has been the cause of the formation of this large lake Most of the granite on this lake has a peculiar pink shade.

Another mass of rock occurring with the granite on the "tote" road from lake Wawa to Hawk lake and just north of the third small lake in that chain, is a quartz porphyry containing very large porphyritic crystals of quartz and some of orthoclase, lying in a very fine-grained ground mass. Cutting this porphyry is a dike of diabase containing quartz, epidote. chlorite, and in a few places pyrite in considerable quantity. In this rock some one had sunk several test pits, while investigating for copper.

Pleistocene Geology

It is not the writer's intention to touch on this subject more than to briefly state a few observations made, since Dr. Coleman has already extensively investigated this feature of the geology of the district.

The writer was struck by the large morainic deposits which occur on Pickerel lake. The hills rise some seventy-five feet above the lake, and on lake Anjigomi they are much higher.

On Summit lake there is a short esker, stretching from the hills to the lake, forming a distinct rounded sand and gravel ridge.

In going down Hawk river one notices the great width of the valley, which is nearly one-half mile wide and carved out of very hard rocks. It looks as if this had been the valley in glacial days of a much larger river than the one at present flowing through it.

On the last small lake expansion of Hawk river before one enters lake Manitowick, there may be seen two quite distinct sand and gravel terraces, one about five feet and the other about eighty feet above the present water level. The sand is quite perfectly stratified, and there is no sign of shells in it. No doubt these terraces are the remnants of the beaches of the large glacial lakes which at one time covered the whole region.

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END OF PART I.

REPORT OF

THE BUREAU OF MINES

1906

VOL. XV. PART II

THOS. W. GIBSON, Director

Clay and the Clay Industry of Ontario

BY

M. B. BAKER

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY OF ONTARIO

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LIST OF ILLUSTRATIONS.—*Continued*

PREFACE.

The more stable but more prosaic mineral industries of a country are apt to be somewhat neglected for those which appeal more strongly to men's imagination or cupidity. The clay working industry, which next to agriculture can be called the most ancient of industries, has up to the present been almost ignored by scientific workers, although during late years in Germany, the United States and in other countries, it has been receiving more attention. Several of the States of the American union, and other countries now have departments devoted to the study of clay and its products. In Ontario the clay industry has grown rapidly during recent years. Brick, which is cheaper than stone, is being used in modern cities in place of wood for fire protection purposes. As years go on the clay industry must become proportionately more important. It is well, therefore, at this time, for Ontario to have a systematic report such as that of Mr. Baker on "Clay and the Clay Industry."

In Part I. of his report Mr. Baker gives, in 41 pages, an account of the character, origin and modes of occurrence of clay, written in such a way as to be understood, it is believed, by persons who have had little technical training. His age classification of clays will doubtless be found very useful by manufacturers, as well as possessing an educational value from the side of culture. Every worker's interests will be widened and his mental attainments broadened by his understanding something of the origin and relationships of the materials with which he is dealing. There is nothing in Mr. Baker's report treating of the relationships of the various shales and clays—Erie, Red Top, Leda and Saugeen—with which every clay worker in the Province has something to do, that cannot be understood by almost any one who can read English. Manufacturing difficulties will thus be avoided, and a scientific knowledge will be gained which cannot be estimated in mere dollars and cents.

The 15 pages of Part II. are devoted to the Manufacture of Clay Products. Methods of manufacture are described, and practical hints are given for overcoming difficulties which are met with almost daily in manufacturing.

In Part III., pages 56-112, typical shale and clay working plants are described under the heading of counties, which follow one another in alphabetical order. This part of the report will be of local interest. The clay worker who desires to gain a knowledge of the modes of occurrence of his material will have descriptions of similar occurrences in his own county with which to compare it.

Pages 112-120 deal briefly with various industries in which clay is used as part of the raw materials.

The seventy-one illustrations in the report have been carefully selected to illustrate typical occurrences of clay and shale, to throw light on the modes of occurrence of these materials, and to represent various machines and plants used in the clay industry in the Province.

Mr. Baker's labors in connection with the industry have not only been of value in the preparation of this report, but he has done work, which has been highly commended by clay workers in various parts of the Province, in giving practical advice in his visits to many plants.

Three or four years ago the clay workers, first of Ontario, and now of the whole Dominion, organized a society known as the "Canadian Clay Products Manufacturers," which holds an annual meeting—the last two being at Waterloo and Hamilton respectively—at which papers are read and discussions held on various topics connected with the industry. These meetings have proved very valuable, and every clay worker of the Province should join the rapidly growing membership of the society.

The statistics of the clay industry show more clearly the relative importance of clay among mineral products. In this Province the manufactures from clay have till recently represented nearly 20 per cent. of the output of our total mineral industry. In the United States clay products form nearly 10 per cent. of the very large mineral ouptut. Moreover, it should be remembered that a high percentage of the receipts from the clay industry are expended on labor and supplies. From this point of view no mineral industry can be claimed to benefit a community or a country more than that whose raw material is clay.

W. G. M.

CLAY AND THE CLAY INDUSTRY OF ONTARIO

BY M. B. BAKER

PART II.—CLAY, AND ITS MODE OF OCCURRENCE

In dealing with clay, it would probably be as well to have a clear understanding of the substance itself, before discussing its properties and uses. Almost everyone is sufficiently acquainted with clay to recognize the substance readily, but if asked for a definition of clay it is doubtful whether many could so define it that a stranger would recognize the substance on seeing it. To define clay specifically then, we would say, "Clay is an earthy material which when moistened becomes plastic, and can then be moulded or fashioned into any desirable shape; which shape is preserved intact upon drying. Furthermore, if heated to redness, or slightly above it, the substance fuses, and on cooling assumes a rock-like consistency." From this definition we see that clay has several essential qualities, and cannot well be confused with any other substance.

The above is a rather popular definition, and one easily understood by almost everyone. To define clay chemically, *i. e.*, taking note of its actual composition, we would say that clay is a hydrated silicate of aluminium, with the following formula, Al_2O_3, $3SiO_2$, $2H_2O$. It is a substance resulting from the decomposition of rocks containing silicates of aluminium, with alkalies, etc. Chief among these is the mineral feldspar, which is a silicate of aluminum with the alkalies, potassium or sodium or calcium, having in general the following chemical formula: K_2O, Al_2O_3, $6SiO_2$. Rain-water and percolating solutions in general, on meeting this mineral, dissolve the alkalies and carry them away in solution, leaving behind the silicate of aluminium, which has become hydrated during the change. This part being insoluble is left as a residue, and is a pure kaolin or "residual" clay. We can readily see that pure kaolin, or residual clay, is not very apt to be left undisturbed, but is almost sure to be transported mechanically by moving water, and finds a resting place in some hollow, e. g., a valley or lake. This is the normal method for the collection of clays.

We have seen above that clay is not usually left in the place at which it formed, but is transported or collected into beds by water. Sometimes, however, clays form in place and remain there; they are then properly called residual clays. When we remember that the weathering commences at the surface, and works gradually downward, we see that the surface has been suffering alteration for a longer period of time than the deeper portions, and so we expect to find, starting at the surface, first a layer of completely formed clay; below this a layer composed of a mixture of clay and partially decomposed rock fragments; below this again is a layer of comparatively fresh rock, which passes finally into the undecomposed rock proper.

The character of the clay will naturally vary with the character of the rock from which it is formed. If the parent rock be largely feldspar, with the composition as given above, the resulting kaolin should be white, or nearly so. If the parent rock contain free silica or quartz, then the resulting clay will contain considerable sand, and will be what is known as a "lean" clay; the pure clay being known as a "fat" or "strong" clay. If, again, the parent rock contains considerable iron, the resulting clay will contain iron, and will be a light yellow to brownish, or even a rich red, color, according to the percentage of iron present. All possible combinations of these may arise. Another point worth considering is the presence of lime in a clay. If the original rock contains limestone, or calcite, considerable of it will be left as grains, mixed with the clay, *i.e.*, particles of completely decomposed mineral, represented by

the clay, will be mixed with particles of undecomposed mineral, represented by the grains of limestone. The reason, then, why our clays are so variable in composition is apparent. It is because all varieties of chemical, as well as mechanical, impurities are present.

The Origin of Shale

We have seen that the most of our clay is a mechanical accumulation of little particles in the bottom of a drainage channel, or a lake. In time these accumulations become so thick, or other mechanical accumulations are piled on top of them by the same collecting process, until the lower-lying clay becomes pressed into a solid rock-like series of bands. This process continues until these sediments finally become compacted into a perfect rock, and this rock is known as shale. Shale differs from ordinary clay in this one respect only, that it has become pressed into a solid mass by natural agencies. If the shale be blasted and pulverized, it will be found to be in every way like the parent clay from which it was formed, and it can be used for all the purposes to which the clay could be put. Occasionally, however, associated with the pressure there has been considerable heat, so that the clay not only becomes pressed but also more or less baked or indurated. The resulting rock will now be a slate instead of a shale, and if pulverized will be found to have lost the properties of a clay, namely, plasticity, easy fusibility, etc.

Fig. 1. Rock surface striated by a glacier.

In Ontario, in fact in Canada, we find few, if any, beds of residual clay. At a time, probably fifteen thousand years ago, a period of intense cold prevailed over the northern part of Canada, accompanied by immense snow-fall. This great accumulation of snow in the northern parts of the Dominion, soon pressed the lower parts into ice, and a series of ice-flows, or glaciers, passed southward over the country, extending roughly to about the 43rd parallel in the United States of America. Evidences of this are to be seen on all sides in our collections of sand, gravel, and boulder clay, which is a mixture of clay, sand and gravel, with many large smooth, round boulders of all sizes. A further evidence is to be seen in the smooth, polishd surfaces of our bare rocks. Needless to say, these immense ice-sheets scoured off and carried away

not only all the collections of clay, which had formed previously from the decomposed rocks, and were lying over the surface of the country, but ground off and carried away probably thousands of feet from the surface of the rocks themselves. For this reason, it is almost useless to look for residual clays in Ontario. The only places where such could be found would be in some decomposed vein, crevice, or other place which had been locally protected from the grinding action of the glaciers.

The only examples of uniform clay to be found in the Province, at least of economic importance, are our shale beds, the method of whose formation has been explained above. Shales of three distinct ages are worked in Ontario. All the pressed brick, decorative brick, terra-cotta, roofing tile and sewer pipe, made in the Province, are manufactured from ground shales. The shales used are the Hudson River shales about Toronto, Don, etc.; the Medina shales about Hamilton, Beamsville, Milton and Brampton; and the Devonian shales at Thedford.

Boulder and Lacustrine Clays

Of our ordinary clays, that most commonly distributed is the boulder clay, which, as we have seen, is of glacial age. Being a mechanical collection, simply scraped together by the glaciers, we must expect great variations in its composition. For

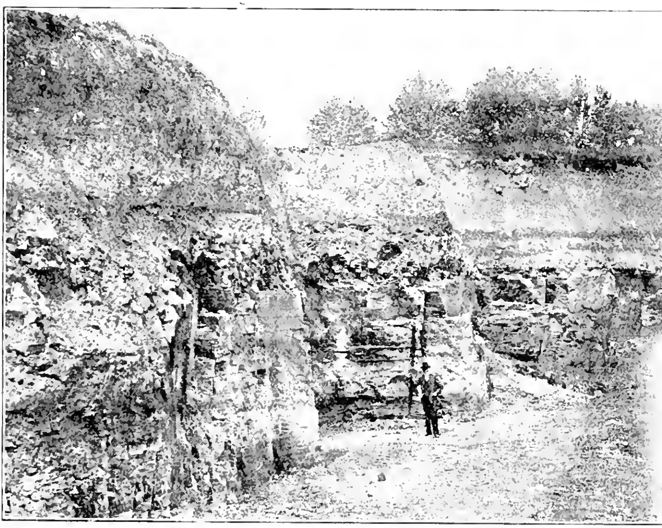

Fig. 2. Sclater's quarry, St. Mary's, Perth County. For lime burning only. Ten feet of clay and gravel overlying limestone.

example, we find it in one place quite clean, at another, and but shortly removed from the first, it is very sandy, or gravelly, or even filled with large, round boulders, but almost always containing such a large percentage of clayey material that the whole deposit is called a clay. In many places it is so free from sand, pebbles, or other mechanical

impurities that it presents a fat, clean clay, and it is in these places that it is used for the manufacture of brick and tile. The surprise is, that so much of the clay should be found so free from impurities. The series of analyses given below made from Erie clay, taken from all parts of the Province, show what a remarkable uniformity there is in this accumulation as a whole. (See table on page 14.)

This remarkable sameness in the clays of the Province would seem to indicate the presence of immense quantities of water, associated with the ice, because in most cases where sand or gravel is found with the clay, it is well sorted into distinct beds, and where large deposits of clay are found, many of which are from 70 to 120 feet thick, they are remarkably clean, only occasional stones being found scattered through them, which would appear to have dropped from pieces of floating ice, in melting.

There is still a third class of clay found in Ontario, namely, lacustrine clays, or clay, collected locally into hollows or lakes. These accumulations have taken place since glacial times. Such clays will naturally be re-sorted glacial clay in most cases, with possibly here and there a slight accumulation of clay formed from the decomposition of exposed rock surfaces. These clays will not be widespread, nor of great thickness, as the time since the glacial period is, from a geological standpoint, not a long one.

We have now shown that the clays of Ontario are of three great classes, according to their method of accumulation. Keeping this in mind, we may classify our Ontario clays as follows. In this classification, the shales as well as the clays are taken into consideration, as the shales are simply the clays of earlier times, pressed into a hardened or rock-like form, and as we have seen above, they require only to be blasted and pulverized to be in every respect true clays, and capable of being used extensively in the manufacture of clay products. The classification as given below is in descending order.

Age Classification of Ontario Clays

WESTERN ONTARIO.		EASTERN ONTARIO.	
	Post-glacial—Lacustrine.		Post-Glacial—Lacustrine.
Glacial	Saugeen. Upper Erie or Red Top. Erie Boulder.	Glacial.	Saugeen clay. Upper Leda or Sadicava sand. Leda. Boulder.
Pre-Glacial	Residual. Underlying rocks including Hudson River, Medina, and Devonian shales.	Pre-Glacial.	Residual. Underlying rocks comprising chiefly limestones and igneous rocks, but no shales.

The above classification is based upon the time of the accumulation. Amongst the pre-glacial, we notice residual clays. These have been discussed above with the possibility of their occurrence in Ontario, and nothing further need be said here concerning them.

Composition of Ontario Shales

As to the shales of pre-glacial times, they play an important part in Ontario, for the manufacture of all the better classes of clay products. As mentioned already, the three shales used in Ontario are the Hudson River, Medina, and Devonian. The Hudson River shale is a red-burning shale with certain bands more highly calcareous, which burn to cream or buff-colored goods. These shales are worked exten-

sively about Toronto and the Don, and at Toronto Junction, in the manufacture of vitrified paving brick by the Ontario Paving Brick Company. The Medina shales are very abundant about Hamilton, Milton, and up the Credit Valley. They are a rich red color, so much so, that the surface of the ground, where these shales occur, is quite red or painty from the leaching of the iron from the shales. Needless to say, this Medina shale burns to a rich red color, although there are many bands of a blueish-gray shale in the Medina, which, if blasted and worked by themselves, yield an excellent buff-colored product. These shales are used in the manufacture of pressed brick,

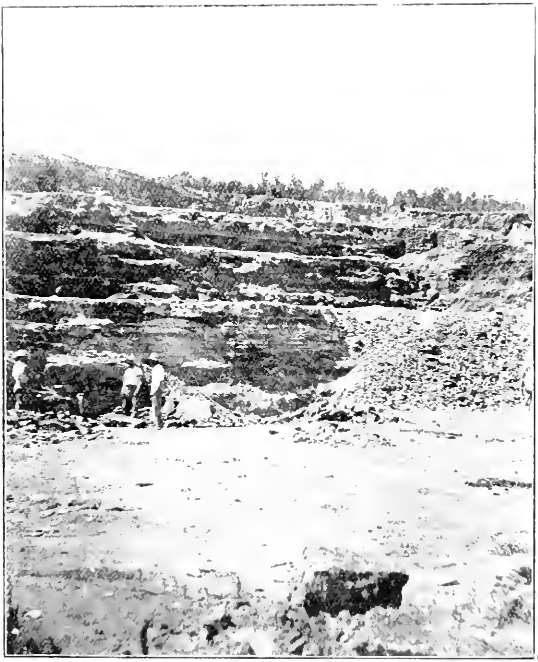

Fig. 3. Shale bank, Milton Pressed Brick Co., Milton. Note lighter band of shale about half way down section, which burns to buff brick : also over-burden of boulder clay.

terra-cotta, etc., at Beamsville, Milton, Brampton and other places in the Credit Valley, and are also used at Hamilton, Swansea and Mimico in the manufacture of glazed sewer pipe.

The Devonian shale is worked at only one place at present in the Province, namely, at Thedford, Ontario. Here the shale is of a deep blue color, resembling very closely ordinary blue Erie clay. It is exposed on the surface by the removal of the overlying sandy Erie clay from 8 to 12 feet in thickness. The surface of the shale on exposure to the air, soon slakes sufficiently to be dug, and is used then like an ordinary clay

in the manufacture of brick and tile by the stiff-mud process. Scattered through this shale, and occurring abundantly in the overlying clay, are many fossils of Devonian age, including among others the following: Zaphrentis prolifica, Cystiphyllum, Heliophyllum, Crinoidea, Spirifera mucronata, Favosites, and many other typical Devonian fossils. The following are analyses of these various shales:—

ANALYSES OF WESTERN ONTARIO SHALES.

No. sample.	Silicia. per cent.	Alumina. per cent.	Ferric Oxide, per cent.	Lime. per cent.	Magnesia. per cent.	Soda. per cent.	Potash. per cent.	Sulphur trioxide. per cent.	Loss by heat. per cent.
9	54.96	19.15	6.68	4.02	2.71	.30	3.47	.63	8.48
15	66.82	11.68	6.58	.62	.90	.38	2.58	.59	8.85
18	59.84	17.78	6.20	2.48	3.11	1.25	2.73	.27	6.10
19	56.52	15.21	5.82	6.86	2.82	.56	3.59	.20	8.79
20	56.46	18.19	7.43	2.56	2.93	.63	3.54	.15	8.52
21	47.98	13.10	4.82	12.53	3.25	.78	3.39	.13	14.50
22	53.20	17.73	6.91	6.00	3.24	.46	3.40	.14	9.58
23	65.04	16.14	6.37	.80	2.17	.64	3.21	.12	5.98
24	55.90	18.46	6.60	3.82	2.65	.53	3.55	.31	8.74
36	50.40	15.21	4.11	10.13	4.60	1.95	2.59	.27	11.00
70	59.54	17.20	5.43	6.72	2.42	.50	1.60	.17	7.44
71	57.86	20.00	6.83	2.92	3.25	1.70	2.70	....	5.74
72	43.38	10.96	4.56	18.00	3.33	1.30	2.12	....	16.52
73	57.12	18.52	7.28	3.92	3.32	.40	3.06	....	6.40
74	63.60	16.49	5.27	.99	2.40	1.04	1.30	....	8.71

9.—Red burning Devonian shale which is allowed to slake on the surface, when it is dug and worked into brick and tile by the stiff-mud process, by Mr. Elliot, of Thedford, Ont.

15.—A shale probably of Hamilton age, occurring in Lambton county, and underlying Erie blue clay, No. 14, at Alvinston. The shale occurs in the bed of the river. It has never been worked, but would yield splendid red products.

18, 20.—Red-burning Medina shales, worked for brick by the Port Credit Brick Company, at Port Credit.

19.—Red-burning Medina shale worked for red pressed brick by the Brampton Pressed Brick Company, of Brampton.

21.—A bluish-gray shale, interbanded with the Medina shales and made into buff-colored pressed brick by the Milton Pressed Brick Company.

22.—Red-burning Medina shale, from the same deposit.

23.—Red-burning Medina shale, manufactured into glazed sewer pipe by the Toronto and Hamilton Sewer Pipe Company, of Hamilton. The shale is blasted and shipped by Grand Trunk from Waterdown, Ont.

24.—Red-burning Medina shale, which is allowed to slake and is then dug and used for the manufacture of red pressed brick, by George Crain, of Beamsville, Ont.

36.—Another sample of the Devonian shales from Thedford, Ont. This sample taken a little lower in the bank than No. 9 above, would probably burn buff-colored products.

70.—A red-burning shale-like clay blasted out and worked by Wagstaff, Webb, Logan and Price, Greenwood Ave., Toronto.

71.—Red-burning Hudson River shale used for manufacture of red pressed brick by the Don Valley Brick Company, Toronto.

72.—Buff-burning clay, with Hudson River formation, worked by the Don Valley Brick Company, Toronto.

73.—Red-burning Hudson River shale, used by the Toronto Fire Brick Company, Mimico, for manufacture of red pressed brick.

74.—Red-burning Hudson River shale, used by the Ontario Paving Brick Company at Toronto Junction, for the manufacture if vitrified paving brick.

We have now had a description of the pre-glacial clays and shales of Western Ontario. In Eastern Ontario all that was said regarding residual clays would appply equally well, but there are none of the shales mentioned above in this part of the Province, the underlying rocks being, for the most part, stratified limestones and sandstones of Cambrian and Ordovician age, together with igneous rocks of pre-Cambrian age. None of these are suitable for the manufacture of clay products.

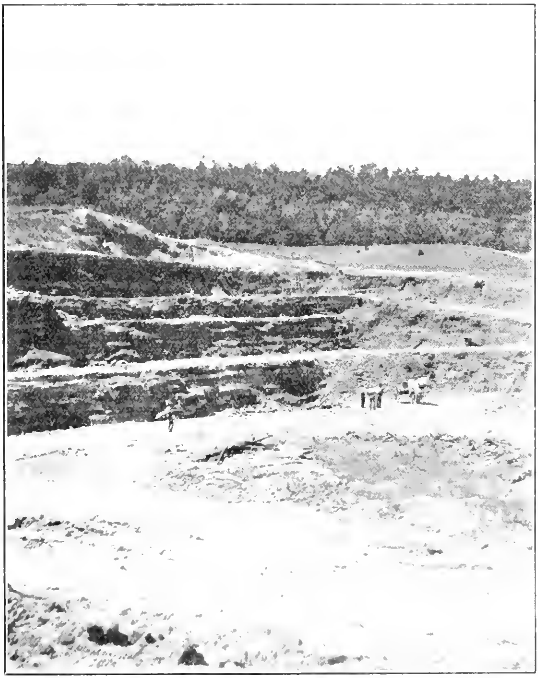

Fig. 4. Bank of Medina shale worked by Toronto Pressed Brick Company, Milton. Note overburden of boulder clay.

The Province has been divided into these two parts, the Eastern and the Western, because there is a distinct difference between the clays found in these two sections. If a line be drawn roughly from the town of Prescott, on the St. Lawrence River, in a northwesterly direction through Perth, Ottawa, Arnprior, and on northerly, it will be found to divide the Province roughly into its two areas. In these two areas the clays, though contemporaneous in age, are distinctly different in composition and other characteristics. We shall discuss the western area first.

The Clays of Western Ontario.

Immediately overlying bed rock, it will be noted in the table above, that we have boulder clay, followed by Erie; Upper Erie, or what is called in this report, for reasons which will appear later, "Red-Top" clay; and all these are followed by Saugeen clay. All of these clays are glacial in origin. This term is not used to indicate that they were collected by the glacier, but rather that the accumulation took place at some time during the glacial period, some of the clays being formed directly by the glacier and collected by it, *e. g.*, the typical boulder clay; others from material ground up by the glacier, but collected in the presence of great quantities of water with masses of ice floating in it, *e. g.*, the cleaner parts of the Erie clay, where we have only scattered pebbles dropped into the clay by the melting of floating ice. Again, we have accumulations of clay practically free from stones or gravel, *i. e.*, beds of inter-stratified clay and sand, repeated many times, showing no doubt the flood and ebb of the water in the retreating or melting stages of the glacial period. Each of these will be discussed more fully.

The Boulder Clay

By boulder clay is meant those mixed accumulations of sand, gravel, clay, and mixed boulders, the whole mass containing a sufficient amount of clay or clay-like powdered rock, as to justify its being called a clay. These boulders, whether large or small, even to the fine gravel, represent the scoured, rounded fragments of rock carried by the glacier, and smoothed and polished by its action. The pebbles or boulders represent pieces of rock of every description. Many of them are fragments of limestone, from the adjacent limestone areas of the Province, but many others are pieces of igneous rock carried for unknown distances from the northern part of the country. In many cases the boulders, gravel, or coarse sand is considerably sorted and collected into patches or bands into the clay. Needless to say, this typical boulder clay is practically useless for the manufacture of clay products.

The Erie Clay

The Erie clay represents local deposits of the boulder clay, which are often so free from stones and gravel, and so largely made up of clay, that it can be used in the manufacture of clay products. At no place in the Province has this clay been found absolutely free from stones, but it is in many places sufficiently clear to them to be used in the manufacture of brick, tile, etc., the few pebbles which it does contain being removed by one of the processes mentioned in part two of this report.

The Erie clay is widespread in Ontario. In Geology of Canada, 1863, we find a note on the Erie clay, as follows: "The Erie clay, with few interruptions, runs along the north shore of Lake Erie from Long Point westward to the Detroit River, and appears to underlie the whole country between this part of the lake and the main body of Lake Huron. It is again found at Owen Sound, and occurs along the Nottawasaga River, and along the shores of Lake Ontario, and as far east as Brockville." Even at that time the Erie clay had been sufficiently studied to show that it was of great extent in Ontario; but during the writer's examination of the clay deposits of the Province, he has found that the Erie clay is much more extensively distributed than was formerly believed. The Erie clay was found in every county west of the line mentioned above as extending from Prescott to Ottawa, showing that the whole of Western Ontario is covered by a mantle of Erie clay which varies in depth from 1 foot to 130 feet, and in many places is no doubt thicker still.

The Erie clay then, appears to be only the cleaner localized accumulations of the boulder clay, and was probably formed in the presence of much more water than was ashy-gray color when dry. It is highly calcareous, as will be seen by the group of the typical boulder clay. The Erie clay is of a deep blue color when wet, and of an analyses given on page 14, so much so that it effervesces freely when moistened with an acid of any kind. Some specimens, especially from the more westerly parts of the Province, contain as much as 30 per cent. of carbonate of lime. They are in reality an impure blue marl rather than a clay. Most of the Erie clays which are used

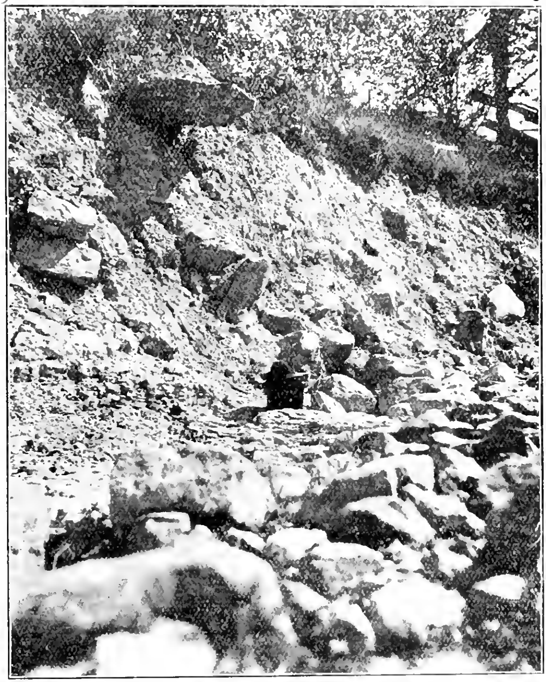

Fig. 5. Boulder clay at Thedford, resting on Devonian shale in place. (Hat and box are on one bed of shale). R. Elliott's yard.

in the manufacture of brick, do not exceed 18 per cent. carbonate of lime, but even this is sufficient to counteract the effects of as much as 6 per cent. of ferric oxide and cause the brick to burn to a white or buff color. All the white brick, white tile, hollow block, etc., made in Ontario, are from the Erie clay. It is usually found in deep banks of a stiff, tough nature, and is commonly known as "blue clay."

Almost everyone is familiar with this clay. It is not often seen on the surface, but in railroad cuttings, in the banks of rivers, and in almost every well, this stiff blue clay, or hard-pan, is readily recognized. When properly worked by the stiff-mud process, and even by the soft-mud process, it yields a good class of brick, but, as is

well known, most of our white brick do not retain their bright cream color for many years. This clay has been recently tried in the dry state in the manufacture of dry-press buff brick, by Mr. Keller, of the Stratford Brick, Tile & Lumber Company, and samples seen recently by the writer were of excellent quality. Should this process be developed, Ontario would hold an enviable position as a brick producer.

One of the best exposures of Erie clay to be found in the Province, is at Goderich, in the banks of the Maitland River. During the past summer the Canadian Pacific Railway Company in constructing the Guelph-to-Goderich branch of their railway,

Fig. 6. Section of Erie blue clay overlaid by sand and gravel: exposed in cutting C. P. railway, Goderich.

built their line along the cliff of the Maitland, making a long sweep from the general level of the country down to the level of Lake Huron, in order to reach the docks. In so doing they used steam shovels to construct a bench on which to place their line, and in the west bank of the Maitland river, exposed a section of Erie clay, fully 120 feet in depth. The uniformity of this great bank of clay is astonishing. With the exception of a few feet at the top and a few feet at the bottom, which are more or less mixed with layers of sand and gravel, and even with boulders, the remainder of the bank is practically pure, stiff, blue Erie clay, with only a few small stones scattered here and there as if dropped from floating ice.

Splendid exposures of the Erie clay, reaching depths of 50 to 100 feet, are also seen in the banks of the Thames near Chatham, on the shores of Lake Erie, at Port

Dover, Port Stanley, and Port Talbot, in the cuts about the Don, at Brantford, at Owen Sound, at Walkerton, and elsewhere, and the blue clay may be seen from 10 to 30 feet thick at almost any place.

It is often interstratified with bands of gray quicksand, which are frequently at such convenient distances apart, that the clay can be worked as a series of benches, the sand making a splendid floor to which to break.

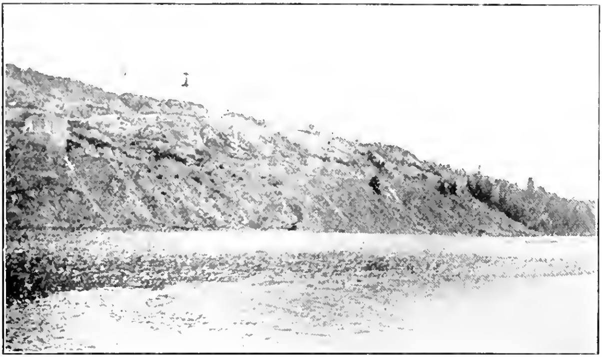

Fig. 7. Bank of Erie blue clay 120 feet deep, in west bank Maitland river, Goderich.

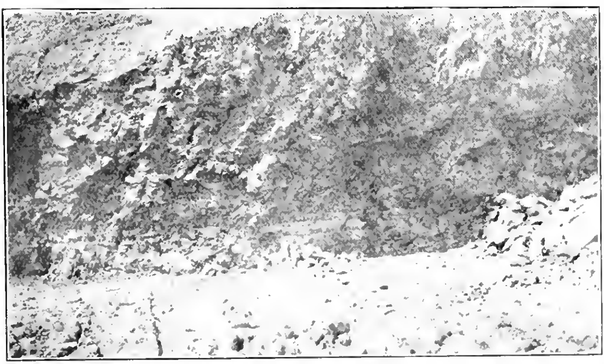

Fig. 8. Close view of Erie clay bank, showing jointings and some laminations at base.

The Erie clay often shows vertical jointing, and in many places distinct lamination with small bands of gray quicksand, or even with thin streaks of gravel. There is no series of characteristics, which will apply everywhere to the Erie clay, and this fact has led so many clay-users to claim that their particular clay is different from all others. Any real differences depend upon the percentage of impurities, such as sand, quicksand, gravel, etc. There are only two or three characteristics which are

constant; namely the blue color of the clay, its highly calcareous nature, and the presence in it of a greater or smaller proportion of stones, rounded and scratched owing to their glacial origin. In addition it always burns to white or buff-colored goods.

If we look at the analyses below, we will be impressed with the uniformity of composition of this Erie clay, and when we think of the method in which it has been accumulated, our surprise is that there is any similarity at all. All the variations claimed by different brick-makers are really small local differences, caused usually by variable proportions of sand in the clay. The presence of sand in a clay will modify the ease of working in almost every way, that is, it will make a difference in the digging, a difference in the amount of water required for tempering, a difference in the ease of pugging, a difference in the facility with which the clay passes through the machine, a difference in the rate and result of drying the brick, a difference in the rate and result of burning the brick, and a difference in the color, porosity, and strength of the brick itself. Consequently, even although we find considerable differences in the manipulation and ease of working in the various yards, the clay is nevertheless only the Erie blue clay, in one or other of its phases.

ANALYSES OF ERIE CLAY.

No. sample.	Silica, per cent	Alumina, per cent	Ferric oxide, per cent	Lime, per cent	Magnesia, per cent.	Soda per cent.	Potash, per cent.	Sulphur trioxide, per cent.	Loss by heat, per cent.
2	40 16	13 76	5.58	15.74	3.78	.70	2.00	.17	17.48
3	45 46	9.73	3.83	15.80	5.06	.78	1.85	.12	17.37
5	44 30	11 21	4.05	16 10	3.81	.93	2.09	.26	17.74
6	38.40	9.62	3.94	17.32	5.88	.98	1.35	.15	21.46
8	37.72	10.72	3.51	16.90	7.05	.87	2.19	.18	21.76
11	38 94	12.10	4.83	17.58	4 17	.90	2.38	.52	18.62
12	50.20	12.66	5.14	11 46	2.93	1.35	2.12	.53	13.88
13	41 40	12 54	4.88	15 98	4 20	1.00	2.33	.02	17.65
14	39 92	12.69	4 67	16.56	3.72	.76	2.43	.38	18.82
17	40 14	15 04	4.56	14 60	4.97	.81	1.86	.06	18.51
25	37.50	10 31	3.59	22.56	2.61	1.11	2 34	.12	19.60
27	34.18	9 11	3.71	23.33	4 83	.90	1.76	.19	22.30
30	51.92	13.74	5.03	10.03	3.78	1.67	3.06	.19	11.34
31	51.30	9 80	3.70	13 63	3.82	1.64	2 27	.14	13.88
37	45.89	14.10	5.56	10 00	3.00	2.22	1.63	.19	13.94
38	51 06	15.58	4.78	10.00	4.47	2.42	2.68	.57	9.76
39	47 50	13.66	4.44	15.58	.80	2 82	1.60	.15	12.94
40	52 17	14 90	4 20	9.19	4 14	1.91	2.16	.16	10.90
41	53.22	14.03	5.21	11 08	.61	1.01	3.44	.30	11.87
42	49 85	15.10	6.18	11.32	4 13	1.35	2.79	.20	10.28

2. Erie, blue clay, underlying No. 1, for whose analysis see table on page 17. This blue clay is worked at Stratford for white brick and tile, and has recently been used by the Stratford Brick, Tile & Lumber Co., in the manufacture of buff-colored dry pressed brick. It yields a first-class sharp-edged brick.

3.—Sandy Erie clay, worked by F. Entricken for the manufacture of white brick and tile at the Little Lakes, three miles east of Stratford.

5.—Stiff Erie blue clay, worked by Bechtel Bros., of Waterloo, for the manufacture of wire-cut brick and tile.

6.—Sample of Erie blue clay taken from C.P.R. cut at Goderich. This clay here reaches a depth of 120 feet, and rests directly on glaciated limestone.

8.—Erie blue clay as found in the Crediton yards, and worked into white brick and tile. It is overlaid by a thin band of Red-Top clay, No. 7. (See table on page 17.) But this clay has never been recognized or worked.

11.—Erie blue clay, worked by James Irwin at Norwich.

12.—Sandy Erie blue clay, worked in two yards situated side by side at Orwell. Used chiefly in the manufacture of tile.

13.—Stiff Erie blue clay, manufactured into white brick and tile by the stiff-mud process, by H. Janes of Delaware.

14.—Stiff Erie blue clay about 70 feet deep overlying shale No. 15, (see table on page 8,) and manufactured into white wire-cut brick and tile at Alvinston.

17.—A mixture of yellowish brown Erie and typical blue Erie clay, as used by Bell Bros., at Paisley.

25.—Stiff Erie blue clay, yielding excellent white tile, and worked for brick and tile by the Beaverton Brick and Tile Company, at Beaverton.

27.—Erie blue clay, very highly calcareous, yielding a very white brick and tile, and used for the same at Picton.

30, 31.—Two samples of Erie blue clay, which are found underlying red top clay, No. 29, (see table on page 17,) and used for the manufacture of white brick, by Wiser & Son, Prescott.

37.—Sample of Erie blue clay as found on St. Joseph's island, yielding a buff-colored brick.

38, 42.—Samples of sandy, yellowish brown, upper Erie clay, as found underlying Red Top clay No. 48, (see table on page 17.) Used in the manufacture of white brick and tile by the soft-mud process, and the Kells machine respectively, by Thomas Henderson of Renfrew.

39.—Sandy Erie blue clay, overlaid by Red Top clay No. 57, (see table on page 17), and manufactured into white brick by the soft-mud process, by Curtis Bros., Peterborough.

40.—Blue clay, very sandy, and not very calcareous. Burns to buff-colored products, and worked by the Imperial Land Co., of Sturgeon Falls. A thin layer over Saugeen clay; therefore a lacrustine clay.

41.—Stiff blue Erie clay, not strongly calcareous, and found above sample No. 27, at Sullivan's yard, Picton. Note the difference in the percentage of lime, between this clay and No. 27 above, taken from the same bank, but No. 41, being at a higher horizon than No. 27, has lost considerable of its lime contents by the leaching action of percolating solutions.

The Upper Erie or Red-top Clay

The upper Erie, or what the writer has named the Red-Top clay, found in Ontario, is not a separate formation. It represents simply a weathered zone on the top of the Erie clay. It has been given a distinct name, the Red-top, because it is an extremely important formation in Ontario. It was formerly thought that all the red brick, tile, etc., made in Ontario, were from the Saugeen clay, or from the shales as explained above. But this is not the case. Nine-tenths of the red brick made in the Province, are simply the product of the upper weathered band of the Erie blue clay. This weathering usually extends from one to three feet below the surface, rarely deeper than this.

The weathering extends to a very uneven line, in some places reaching 3 feet, while in others not over a foot. The deepest spots were along cracks or joints, or following roots of weeds, shrubs or trees. An idea of the irregularity of this weathering may be gathered from fig. 9. Here we see how irregular is the contact between this Red-top clay and the underlying Erie clay. This fact leads to a great deal of trouble for those brick makers using the Red-top clay, as they are constantly digging too deeply, thereby including some of the underlying blue clay, which causes the resulting brick to be spotted by inclusions of the white-burning clay.

From the analyses given below, it will be noticed that the lime is reduced from roughly 16 per cent. in the case of the Erie clays, to about 2 to 4 per cent. in the Red-top, while the percentage of iron remains about the same. The percentage of magnesia is also reduced, and the loss on ignition is also lessened from roughly 18 per cent. to about 5 per cent. All these are the result of the weathering of the original Erie clay.

We mentioned above that the Erie clay was highly calcareous, that is, it contains abundance of calcium carbonate. In burning this Erie clay, the calcium carbonate is broken up by heat, and carbon dioxide gas is given off, which accounts for the large percentage of loss by ignition. It is a well-known fact that calcium carbonate is soluble in acids, however weak. Ordinary rain water existing as clouds, or when further

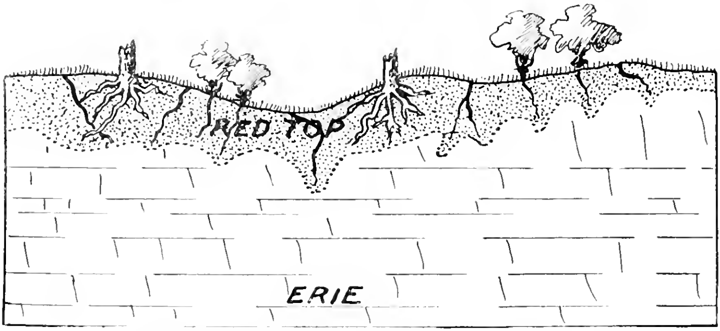

Fig. 9. Ideal section, showing how weathering penetrates a clay bed, especially along roots and cracks in the clay. This process has produced the Red-top clay from Erie blue clay.

condensed and falling as rain through the air, and further still by coming in contact with decomposing vegetation on the earth's surface, becomes more or less charged with carbon dioxide gas. The rain water thus becomes, in reality, a dilute solution of carbonic acid, and on meeting the Erie blue clay dissolves much of the calcium carbonate.

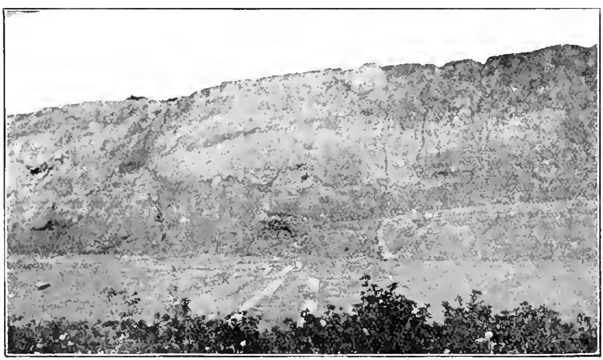

Fig. 10. Section of Erie clay bed, with Red-top clay above as the darker weathered top of the Erie, which in the cut is lighter colored.

carrying it away in solution. Thus we have the resulting weathered Red-top clay, much reduced in lime and magnesia and with a corresponding diminution in the amount of loss on ignition.

Iron oxides are almost insoluble in these dilute solutions, therefore the percentage of ferric oxide is left practically unchanged. The result is, the iron which was present

in the blue clay is still present in the Red-top clay, and being no longer counteracted by the high percentage of lime, it is able to burn to the ferric state, thereby coloring the brick red.

In every place where the Erie blue clay is found in the Province, and exposed on the surface, a band of the Red-top clay of some thickness was found as the first mantle varying from a few inches to 3 or 4 feet, according to the ease with which the percolating solutions could attack the clay. And in every case upon digging through the Red-top clay, the underlying Erie clay was found. So invariable is this, that in almost every brickyard in the Province, both red and white goods are manufactured from the same clay bank, the red clay being dug off the top, from one to three spades deep, and worked by itself into red brick, tile, etc., after which the underlying Erie clay is dug, and worked by itself into white products.

In all other respects the Red-top clay corresponds to the Erie clay, *i.e.*, it is distributed throughout the Province, is in many places so stony as to be properly a boulder clay, while in many others it is like the Erie, almost free from stones. As already mentioned, the upper portions as well as the base of the Erie clay are usually a little more sandy, gravelly, and stony than the more central parts. We therefore find considerable of this Red-top clay quite stony, and a great deal of it is leaner, *i.e.*, more sandy, than the underlying stiff blue Erie clay. The following analyses of the Red-top clay will show how uniform it is throughout the Province, corresponding in this feature with the uniformity of the Erie clay.

ANALYSES OF RED TOP CLAY.

No. sample.	Silica per cent.	Alumina. per cent.	Ferric Oxide. per cent.	Lime. per cent.	Magnesia. per cent	Soda per cent	Potash. per cent.	Sulphur trioxide. per cent	Loss by heat. per cent.
1	69 12	14 03	4 81	1.94	1.10	1 53	2.05	.10	4.80
4	67.10	15.30	4.80	1.63	1.59	.91	2.30	.16	5.44
7	63.56	16 91	6.24	1.91	2 42	.70	3.15	.28	5.64
10	65.06	14.15	4.67	2 36	2.18	1 48	2 66	.32	6 76
29	61.08	17 28	6 20	2 54	2 35	1.80	3.50	.16	5.19
43	59.48	17 48	7 38	2 60	3.32	1.74	2 96	.30	3 82
44	66.14	14 80	5.50	1.76	1.50	1.33	2.19	.25	6.56
45	63.28	17.20	6 26	2 82	1.60	1.85	3.14	.16	4.30
46	58.97	18 10	7.30	2 84	2 50	2.12	2.40	.14	5.90
47	57.88	18.64	7.20	2.86	1.95	1.46	3.22	.18	6.64
48	54.38	19.18	7.30	4.60	3.70	1.42	3.62	.12	5 60
49	55.34	19.80	7 62	2.18	2.39	1 93	3.74	.13	7.12
50	59.96	19.58	5.86	2 62	2.30	2.48	2.57	.23	5.00
51	61.78	16 03	6 16	3 37	2 28	1.95	2 38	.31	5.50
52	57.16	20 45	6.28	3.12	2 72	1.40	2.76	.17	5.00
53	56.18	19 40	6.69	2.88	1.94	1.32	3.76	.17	8.80
54	58.00	17.04	6.16	2 84	3.43	1.42	3 72	.13	5.52
55	57.18	16.38	7.36	2.76	3.91	2.34	3 21	.09	5.96
57	64.44	15.26	5.96	3.65	1.78	2.52	3 20	.21	2.92

1.—Clay from 1 to 3 feet deep overlying No. 2. (See table on page 14.) Worked for red brick at Stratford, Ont.

4.—Red-top clay, one and a half to three feet thick, dug at Stratford and shipped by Grand Trunk railway to Durham, for the manufacture of Portland Cement.

7.—Red-top clay, 6 inches to 2 feet in thickness, overlying Erie clay No. 8. (See table on page 14.) Will yield an excellent red brick if worked by itself. Sample taken from Mr. Kuhn's yard at Crediton.

10.—Red-top clay worked in the several yards making red brick at Conestogo.

29.—Red-top clay about 3 feet thick overlying No. 30 and 31 Erie blue clay (see table on page 14), at Prescott, Ont.

43, 44.—Samples of Red-top clay worked in Mouldy Bros. yard at Kingston.

45, 46.—Samples of Red-top clay, the first containing loam and worked for red brick in F. Lingham's yard, Belleville.

47, 51.—Samples of Red-top clay, the second containing loam, from Mr. Lawrence's yard, Tweed.

48, 49.—Red-top clay one to three feet thick, overlying Erie clays Nos. 38 and 42, (see table on page 14), and worked in Thomas Henderson's yard, Renfrew.

50.—Red-top clay, 3 feet thick, taken from Watson's yard, Orillia.

52, 53, 54.—Three samples of Red-top clay. The first a strong chisel clay, the last two ordinary brick clays, taken from Mr. Rollin's yard, Madoc.

55.—Sample of Red-top clay taken from a cut on the Bay of Quinte railway extension at Bridgewater.

57.—Red-top clay about 2 feet thick, overlying Erie blue clay, No. 39, (see table on page 14), and worked for red brick by Curtis Bros., Peterborough.

The Saugeen Clay

The latest of the glacial clays, or that named in our classification Saugeen, is a distinct and separate clay, readily distinguishable from the Erie and the Red-top.

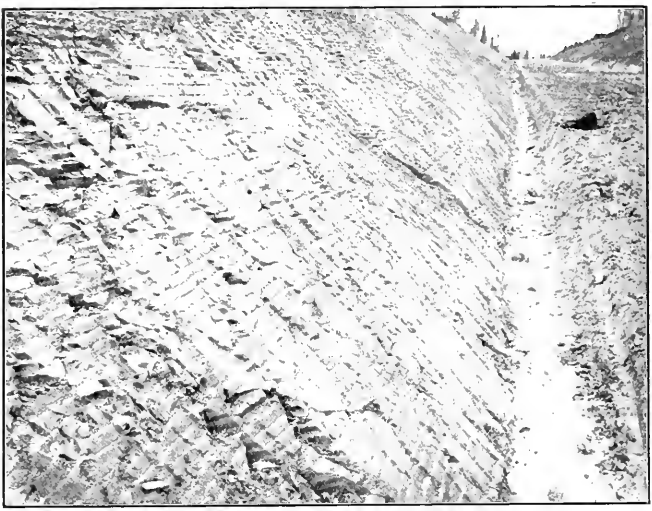

Fig. 11. Saugeen clay along railway near the shore of Lake Temiskaming, between Haileybury and New Liskeard, Ont.

It is found in every case overlying the Erie clay, unconformably, and is usually separated from it by a layer of sand or gravel. In Geology of Canada, 1863, page 896, we find the following note: "Two divisions have already been indicated in the stratified clays of western Ontario, the lower of which was partially worn away before the deposition of the upper division, so that this rests unconformably upon it, adapting itself to the irregularities of the denuded surface. The latter is sometimes associated with beds of sand or gravel, a layer of which belonging to the upper division sometimes marks the contact with the underlying deposit."

"The upper division of these deposits which is largely developed and well-exposed along the Saugeen river, may be called the Saugeen clay. With the exception of a yellow band sometimes found at the top, it consists of thinly bedded brown calcareous clay, containing but few boulders or pebbles. The layers of clay seldom exceeding an inch in thickness are separated by thin partings of a drab or olive color. This

division is sometimes underlaid by beds of sand which separate it from the Erie clay; and in certain parts of its distribution it is also interstratified with sands and gravels."

From the above reference we see that this clay was known, and very accurately described nearly half a century ago. It is as mentioned above, a series of interstratified bands of a rich, reddish brown clay, with bands of gray or greenish gray sand, or shell marl. In some places the bands are only slightly calcareous, as at Walkerton, while at others the gray bands are almost entirely calcium carbonate, as for instance along the line of the Temiskaming and Northern Ontario railway, between Haileybury and New Liskeard.

Regarding this clay, W. G. Miller in the Report of the Bureau of Mines, 1905, Part II, page 26, says, "The soil is essentially a well-banded clay * * * * out crops of solid rock in many cases representing hill tops which project through the clays, are seen. The clay does not constitute a continuous mantle, but there are large areas of tillable land, which have been rapidly settled. North of the height of land, a large agricultural area estimated at 16,000,000 acres, and known as the great Clay

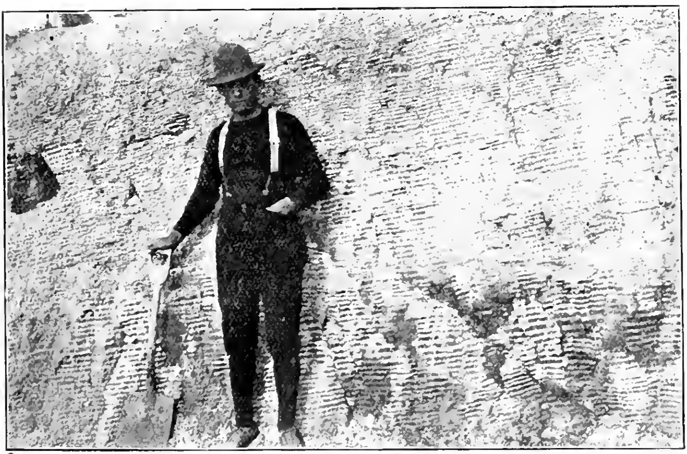

Fig. 12. Finely laminated Saugeen clay, New Liskeard. Note the great number of bands of clay and sand.

Belt, exists, in which exposures of solid rock are few in number, and the clay on both sides of the height of land is pretty uniform in character. The percentage of lime and magnesia are rather high. This is owing to the alternate bands containing considerable marl. The clay effervesces strongly in acid." Analyses of this clay are given below, Nos. 59 and 65, page 26.

If a line be drawn roughly from lake Huron eastward through Walkerton, Hepworth, Paisley, Bracebridge, Pembroke, Ottawa, and Casselman, to the St. Lawrence river, it will be found to form roughly the southern boundary of the Saugeen clay area. The clay as described above is composed of a great number of alternate bands of "fat" clay, with bands of more or less calcareous sand. Each band of clay or sand is seldom over three-quarters of an inch in thickness, but the series is repeated so many times, that banks of Saugeen clay are seen varying from 8 to 20 feet in thickness, the whole presenting a very unique appearance. All the Saugeen clay seen in the Province lies north of the line mentioned above, and the farther north we go the more abundant

is this clay. In age the writer has placed it as dating from the close of the glacial period, for it appears to have been formed from the flow and ebb about the edge of the retreating or melting glacier, and each two bands, *i.e.*, a band of clay with a band of sand, together represent the accumulation for one season. During the summer or warmer months, the increased flow of water carried the clay farther out, and the sand would be deposited closer to the ice margin. In the winter or colder months, when the flow of water was lessened, a layer of clay would be deposited over the sand, and this was repeated year after year, for many years, as shown by the great number of bands in this accumulation. This process would be gradually carried back in a northerly direction as the ice-front slowly retreated, and in this way we find the deposits thicker and more widespread as we go north. The few stones found in this clay—and they are extremely scarce—would be caused by small pieces of floating ice, dropping imprisoned stones, upon melting.

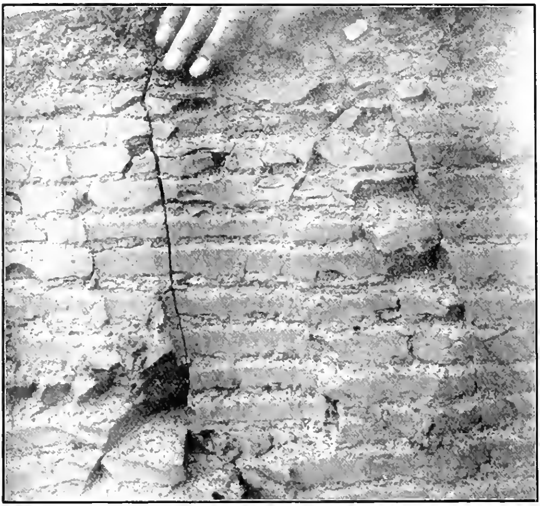

Fig. 13. Saugeen clay. This illustration represents a closer view of a part of the clay bank shown in Fig. 11. The alternate lighter-colored layers are more or less marly.

Composition of the Saugeen Clay

We have mentioned above that the Saugeen clay varies considerably in its composition, more especially in its calcium content. In some places the gray bands which occur with the brown rich bands of clay, are shell marl, *i. e.*, calcium carbonate. In the railway cutting of the T. & N. O. railway between the towns of Haileybury and Liskeard the clay beds are shown in figures 9 and 10; the gray bands are shell marl. In other places the gray bands are sand, for example, at Pembroke, Walkerton and Casselman. In others, again, the gray bands are a sandy clay, for example, at North Bay, New Liskeard, Sturgeon Falls and Sault Ste. Marie. These localities are cited because they are places where the clay is being worked; but local differences of sand contents are often seen in the same yard; for example, at Mr. Evans' yard at Sudbury and at Mr. Elliott's yard at Sault St. Marie. Here a decided difference in the character

of the clay is seen in fifty yards of the clay bank, so much so that it was necessary to change the plant because in the one place the clay was so strong that it could not be worked, the drying being very difficult. A change of only fifty yards to a much leaner part of the deposit yielded a clay which worked admirably in every part of the process.

In places where the clay is marly, it is unsuitable for brick-making. The marl burns to lime and this affects the color of the brick, making them a light pink color. It also causes the brick to break up badly on exposure to heat. Where the gray bands are sand we have a combination which is most desirable. The brown clay of itself would be too strong to work, but the addition of the sand already mixed in the clay renders the whole so mild that it works admirably, and a deep Saugeen clay bank where the clay is interbanded with sand forms the best possible deposit for the manufacture of red stock brick. Such clay tempers easily, shifts easily, dries readily, and burns with little shrinkage, while the sand does not affect the color.

Where the gray bands, with the brown clay, are themselves a gray sandy clay, the percentage of sand is not quite sufficient to make the whole workable, such a deposit being so strong that it can only be mixed with great difficulty. Moreover, such strong clay is very difficult to shift and still more difficult to dry. This is a difficulty which many brick-makers in northern Ontario are experiencing. In drying the brick, they find that if exposed to direct sunlight or to wind the brick crack. This is because the clay is so strong that, having been wet in the making of the brick and now exposed to the air, it really slakes; or, in some cases, the outside of the brick dries so much more rapidly than the inside, on account of the density of the strong stiff clay, that a shell is formed around the outside, so that when the inside of the brick finally dries and therefore shrinks it cracks this shell, or outer part of the brick. Two things would help this clay; first, it should be dug into heaps and allowed to slake thoroughly before making the brick; second, in tempering the clay it should be mixed with about 25 per cent. of clean sand. The character of the sand does not matter much so long as it is clean, that is free from organic impurities and limestone.

The Saugeen clay belongs to the later glacial period. It rests unconformably on the Erie clay with a layer of sand forming the contact. There are a few exceptions to this rule, however. As we work northward from the southern boundary of the Saugeen clay belt, which was described above, we find that the Erie clay becomes shallower in depth until we reach North Bay on the C. P. R. main line, when in general we find that the Erie clay is almost entirely wanting, and the Saugeen clay rests immediately on top of the galciated surface of the rocks. In fact, the rocks form

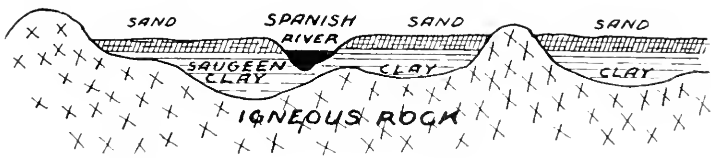

Fig. 14.—Igneous rocks overlaid by clay and sand, and later cut by the Spanish River.

the greater part of the area with local collections of sand, or gravel, or Saugeen clay in the hollows. At North Bay the clay associated with red sand is found in a hollow extending from North Bay to Widdifield on the T. & N. O. railway. Passing northward we find no more clay to speak of till we reach the town of Haileybury. From here north the clay becomes more and more abundant and also quite strong in most places. Soon the Temiskaming outlier of great Clay Belt of New Ontario is reached, composed of Saugeen clay, and is estimated to cover roughly one million acres. For the most part this clay is strong, but it naturally has its sandy places or milder spots, as any other like area would have. Moreover, in some cases in this northern part we find the

Saugeen clay again lying unconformably upon the Erie blue clay, as in the more southerly parts of the Province.

As we work westward from North Bay, clay is not at all abundant till we reach the vicinity of Massey on the Sault branch of the C. P. R. or Kenora on the main line. From Massey to Sault Ste. Marie clay becomes more and more abundant, until at the Sault itself good Saugeen clay is plentifully present. It is used here in the manufacture of stock brick, wire-cut brick and dried pressed brick. We notice, too, as we work westward from Massey that the clay becomes a rich red color, due to the high percentage of iron oxide which it contains. This iron has no doubt been received from the iron-bearing rocks in the northern part of this area.

A very interesting area of Saugeen clay is found between Webbwood and Massey on the Spanish river. The old glaciated igneous rocks are found on all sides as a bed or cradle in which was deposited a series of Saugeen clay and sand, and this was later cut by the Spanish river.

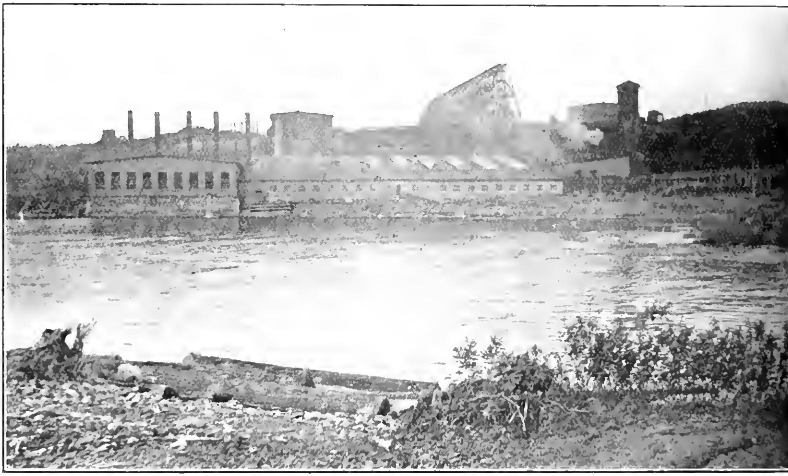

Fig 15.—Large pulp mills of the Spanish River Pulp and Paper Company; also workmen's houses of red brick made from Saugeen clay, Espanola.

Starting at the surface we have a thickness of sand varying from 2 feet to 20 feet or more. This rests on a mild Saugeen clay, *i. e.*, the thin bands of dark clay are inter-laminated with bands of about equal thickness of sand. This mixture renders the whole about 50 per cent. or more of sand, making a very mild mixture. This mild clay is about 8 feet to 12 feet in thickness, and passes gradually into a very strong clay almost free from sand. This series extends as low as the level of the Spanish river, when sand and quick-sand are usually found at about water level.

A Bank at Webbwood

At Espanola on the Spanish river above Webbwood we find one of the best sections to be seen in this series. Here the Spanish River Pulp and Paper Company have erected an immense pulp mill and have built the plant and the workmen's houses of red brick, made from this Saugeen clay.

On the opposite bank of the Spanish river from the pulp mills, we find a section of clay and sand about 35 feet deep. It occurs in a hollow between two ridges of rock as shown in the accompanying cut. The first 5 feet from the water's edge is composed of sand and quick-sand, with a few glaciated boulders mixed through it. Above this we pass into strong Saugeen clay. It is inter-laminated with sand, but the sand partings are very thin, so that the whole series of 10 feet or more is very strong clay. Towards the upper part of this strong belt the sand layers become thicker and thicker, until a belt is reached in which the percentage of sand is about right for a first-class mix for brick-making. This belt is about 10 to 12 feet thick, and is ready to work into red brick as it lies. The underlying strong clay mentioned above would require sand before it could be worked, as it is so strong that it could not be dried or burned as it is. There is abundance of sand on all sides to render this clay the proper temper.

Fig. 16.—Saugeen clay overlaid by sand. Note junction about half-way up the series. Exposed in banks of Spanish River at Espanola.

Above the mild clay the sand gets thicker and thicker, while the layers of clay get thinner till we pass into a series of 6 to 10 feet of very fine sandy clay or almost pure sand with only very thin partings of clay. Three analyses are given below of this series.

Sample.	Silica. per cent.	Alumina per cent.	Ferric Oxide per cent.	Lime. per cent.	Magnesia. per cent.	Soda. per cent.	Potash. per cent.	Loss. per cent.
No. 1.	69.62	13.07	2.99	4.42	1.96	2.98	2.19	3.32
No. 2............	59.50	15.30	5.26	6.15	3.14	2.82	2.50	6.16
No. 3..........	61.40	17.08	6.34	2.66	3.35	1.94	2.74	4.52

No. 1.—Is the sand or sandy clay forming the upper 6 to 8 feet of the section.
No. 2.—The mild, workable clay forming the middle belt of the section.
No. 3.—The strong clay forming the lower part of the section.

The upper sand or sandy clay would do to mix with the strong clay to render it mild enough to work. This sand, however, is rather fine in grain, and coarser grained sand would be preferable. Suitable sand can be had very conveniently on all sides of this deposit, particularly on the opposite bank of the river.

With a good railway siding, plenty of fuel, and plenty of power right at hand, this bank could no doubt be worked to advantage even if the surface sand had to be removed. All these things exist there at present, as the Pulp and Paper Company have developed 11,000 horse power from the high falls adjoining this property, and there is plenty of power going to waste still.

The deposit of clay at the Pulp and Paper Company's works is the thickest one seen yet in the Province, there being fully 25 feet of clay which is already fit for working into brick, etc., or easily made so by the addition of sand.

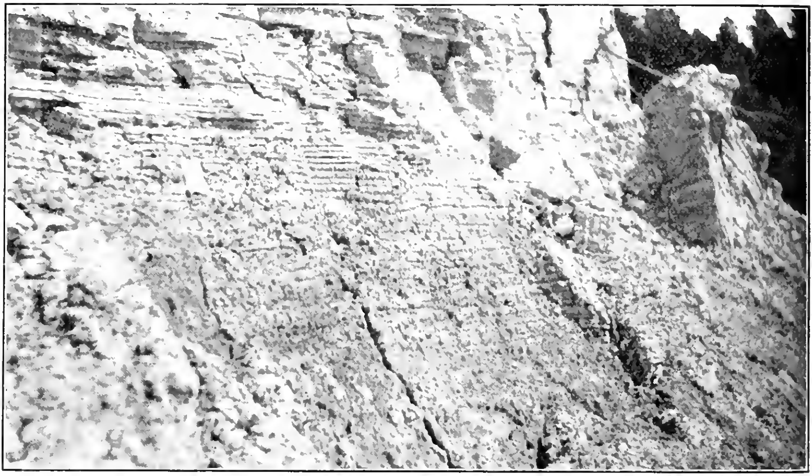

Fig. 17.—Saugeen clay in the Spanish River at Espanola, part of the bank as shown in Fig. 16 much enlarged. Note laminated character of clay.

We notice here that we have the usual layers of sand and quick-sand at the base of the Saugeen series. We note also freedom from boulders or only a few at the base of the series. The layers of clay are very thick and of sand very thin in the lower parts of the Saugeen clay, and as we work up to the surface the layers of sand get thicker and the layers of clay correspondingly thinner till they form mere partings in the sand and marly clay, as the sand did in the clay at the base of the series. These points tend to substantiate the belief that at first we had deep water, few currents and therefore more clay was laid down and little sand, also a shorter period or summer season of melting. As the time went on the melting season got longer and the layers of sand become correspondingly thicker, till towards the close of the period the warmer climates give us much more sand, and less clay. The absence of boulders and pebbles shows freedom from floating ice.

In all parts of Ontario the Saugeen clay is remarkably free from stones and boulders, and for this reason it is an excellent clay for the manufacture of red brick

of all kinds and for the manufacture of tile or hollow blocks. Of course the location must be selected, as with every other clay. If the clay is strong a suitable supply of sand should always be sought near at hand, for it is almost impossible, as we have pointed out, to work this Saugeen clay unless it contains about 25 per cent. of sand, and if this is not already present it must be added by the workmen. If a place can be found where the clay already has sufficient sand interbanded with it to render the whole workable, no better clay could be desired than the Saugeen.

Saugeen clay with marly bands is to be avoided. The marl can always be detected by moistening a sample of the clay with a drop of any acid. If it effervesces, or bubbles, it should be avoided; but if not, it is safe.

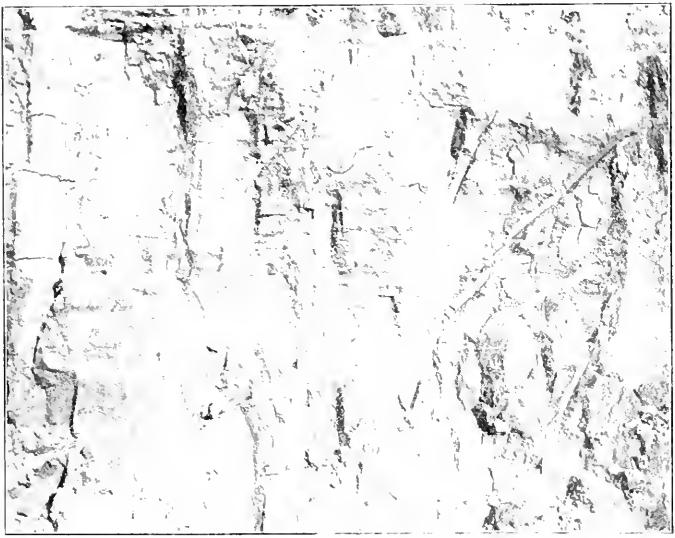

Fig. 18.—Saugeen clay bank at Casselman. Note contact of sand and strong clay, which shows the pick marks and laminations plainly.

The Saugeen clay, as has been stated, is usually underlaid by a layer of sand or gravel. The writer's experience bears this out, for in every case where the Saugeen series and the Erie clay were found associated, a band of gray sand from 1 to 3 feet in thickness was found immediately under the Saugeen. In many cases a layer an inch to an inch and a half of sand has been converted into a flag of sandstone by a certain amount of calcium carbonate having leached down from the overlying clay, cementing the grains of sand together. At Walkerton, for example, the clay bank was drained by occasionally punching a hole through the thin cake of sandstone, into the soft sand below. The water would sink through this hole, and run away in the loose sand below, while the cake of sandstone itself afforded an excellent working floor.

The Saugeen clay with the accompanying sand worked as a whole section, forms the most homogeneous, and the best working clay in the Province, for red products. Being from 8 to 20 feet in thickness, a good supply of practically uniform quality is assured, and this is a feature entirely wanting in the Red-top clay. In the latter, the brick-maker has to skin over the whole of his clay bed, in order to get sufficient red clay for a very few years' run.

The presence of the bands of shell marl proves that the Saugeen clay in the western and northern area was laid down in fresh water. The organisms producing the marl were fresh water forms; and any of the larger shells found in these marly bands represent fresh water types, comprising among others the following,—Planorbis campanulatus, P. bicrinatus, P. parvus, Melandia acuta, M. conica, Cylas similis, etc. We will find in examining the eastern area that the organisms are marine, instead of fresh water.

Fig. 19.—Bank of Saugeen clay, Baker Bros' yard, Casselman. Here the laminated clay is overlaid by about 4 feet of sand

ANALYSES OF SAUGEEN CLAY.

Sample No.	Silica. per cent	Alumina. per cent.	Ferric oxide. per cent.	Lime. per cent	Magnesia per cent.	Soda. per cent.	Potash. per cent	Sulphur trioxide. per cent.	Loss by heat. per cent.
26	63.00	15.15	6.28	3.48	2.67	2.64	3.11	.30	3.63
34	59.34	17.68	6.74	2.94	3.36	2.13	3.07	.47	4.60
35	62.30	16.51	5.65	3.16	2.68	2.25	2.61	.40	3.60
58	61.20	16.40	6.25	3.10	3.25	1.94	2.32	.52	4.94
59	51.00	16.11	4.69	8.26	4.10	1.74	2.76	.09	9.64
56	65.08	14.83	3.17	4.18	2.57	2.76	2.24	.04	5.10
64	64.08	17.21	5.40	2.34	2.75	1.94	2.97	.05	3.90
65	58.30	15.70	5.41	5.10	3.27	2.04	2.73	.04	7.30
66	49.68	13.95	5.32	9.46	4.16	1.96	2.76	.04	1.29
67	65.42	16.06	5.44	3.20	2.31	1.90	3.06	.07	2.78
68	63.20	15.75	4.67	4.32	2.73	1.91	2.80	.04	4.35
69	64.30	15.45	5.22	3.42	2.02	2.51	2.72	.05	3.89

26. Saugeen clay about 20 feet deep worked for tile and brick by Watson & Hutchison at Bracebridge.

34. Saugeen clay about 10 feet deep worked for red brick by Merkley Bros. of Casselman.

35. Saugeen clay, very sandy. Worked from a bank about 10 feet deep by J. Thibadeau at Pembroke.

58. Saugeen clay, a continuation of the bank worked by Merkley Bros., and made into red brick by Baker Bros. of Casselman.

59. Saugeen clay in the railway cutting of the T. & N. O. railway, between Haileybury and New Liskeard. Very marly clay.

56. Saugeen clay worked by the Imperial Land Co., for red brick and tile at Sturgeon Falls.

64. Saugeen clay from Wallace & Son's yard, North Bay; requires sand.

65. Saugeen clay from R. Scott's yard, New Liskeard.

67. Saugeen clay from D. Clark's yard, Powassan. A good clay; about proper percentage of sand.

68. Saugeen clay from A. W. Evans' yard, Sudbury.

69. Saugeen clay used for red pressed brick by the Algoma Commercial Co. of Sault Ste. Marie.

Lacustrine Clays

The latest clay mentioned in our classification is the Lacustrine clay, formed since glacial times. Residual clays formed from decomposing rocks rarely rest on steep slopes, or on hill tops. Moreover, the running water after each rain storm shows

Fig. 20.—Sand and gravel laid obliquely, showing evidence of currents. Photo. of section of gravel bed at Owen Sound.

us that our glacial clays are being gradually carried off the higher ground to lower levels. By such means mixed clays, *i. e.* clays collected from very different sources, are washed down and deposited in new resting-places. As soon as the velocity of the stream is checked, and the water becomes free from currents, the particles begin to drop to the bottom, forming layer after layer of an even-grained, washed clay. Thus all our lacustrine clays will be sedimentary and stratified. They will not be absolutely homogeneous, because all will not have a common source. Moreover, the velocity of the current will not be constant the year round, but there will be flow and ebb, depositing respectively coarser and finer material on any given area. Evidence is seen of currents in the layers of sandy clay or sand itself, showing oblique stratification.

There is no difficulty in distinguishing a lacustrine clay from a glacial clay, because the former is free from stones or boulders and is distinctly stratified. It is distinguished from a residual clay by being entirely different from the underlying formation.

Not many workable deposits of lacustrine clay are found in Ontario. As most of our drainage channels are geologically new, *i. e.* post-glacial, the streams are more or less rapid, and thus the clay is carried into the larger lakes, which have not yet suffered elevation so as to expose the accumulation of clay. A few however, are to be found, *e. g.* the clays about Hamilton, the clays used in the brickyards of London,

Fig. 21.—Section of Iroquois beach exposed at Hamilton, showing relations of clay, sand and gravel.

the clay used in tho brickyard at Conestogo, and some of the clay used about Toronto and the Don. It will not be necessary to describe these clays in detail as the method of their formation is sufficiently explained, and each deposit is a little different from every other. They show accumulations of sand, gravel, and clay interstratified in bands from 6 inches to 3 feet in thickness, many of which, as has been said, show cross-bedding or oblique stratification. In some cases fine beds of gravel will overlie, or be interbanded with the clay, *e. g.* at London, where the overlying gravel from 3½ to 5 feet in depth is carted off for road metal, and the underlying clay is then worked for brick.

At Hamilton, a raised beach composed almost entirely of gravel now cemented into a conglomerate, formed a dam to the Dundas river. Behind this dam the water

collected in a lake-like expanse, and in this the clay carried down by the Dundas river was deposited, so that in the western part of the city of Hamilton is an area of clay about 8 feet deep lying on a terrace of gravel. This terrace is described in detail by Dr. Coleman in the 13th Bureau of Mines Report, 1904, in a paper entitled "The Iroquois Beach in Ontario." Many fine examples of cross-bedding of sand and gravel are to be seen here. For the relations of clay, sand and gravel see fig. 21.

Another deposit of lacustrine clay is found at London, and is used in the manufacture of white brick. This deposit occurs in the north eastern part of the city, and there are a number of brick yards operating upon it. Starting at the surface we find

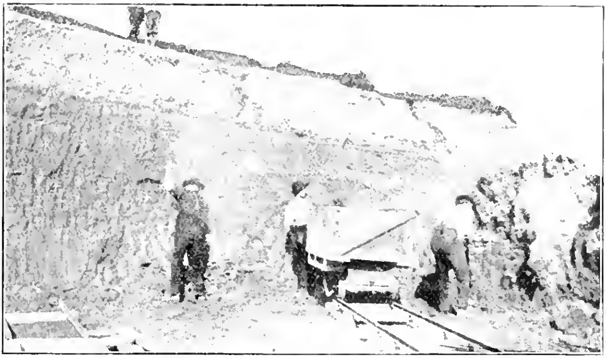

Fig. 22.—Section of lacustrine clay at Builders' Supply Co's plant, London ; four feet of gravel is removed from top for road purposes. The light band is a very strong clay.

from two to four feet of very clean gravel. This is used by the city authorities for road metal. Immediately below this gravel is about two and a half feet of very strong clay (note light band in fig. 22), below which is a mild sandy clay, about two feet deep, and below this are several bands of clay and sand inter-layered. Beneath this whole section we find the Erie blue clay, an unconformity existing between the two. That this overlying clay is not Saugeen is shown by the lack of the alternate bands, the great thickness of the beds, and in its burning to white brick, instead of to red. Moreover, this clay is quite local in its distribution. The bands of strong clay have to be thoroughly mixed with the bands of sand in order to make the whole section workable.

A third occurrence of lacustrine clay of economic value is found about seven miles northeast of Berlin, in a bend of the Conestogo river. Mr. H. D Dalmer operates a yard on this deposit, which is located in a hollow, and at a bend of the river which formerly formed a small lake. In this flat is an accumulation of excellent red-burning clay, varying from 4 to 8 feet in depth. It is very uniform in character, and is free from stones or boulders. It is used extensively in the manufacture of red brick and tile, and yields a very excellent product. No doubt there are many other examples of lacustrine clays, but these were the only ones noticed by the writer during his investigation, as being unmistakably of this origin. Moreover, these were the only deposits which were being used in manufacture of clay products, and have been mentioned for that reason.

Eastern Ontario Clays

We will now turn our attention to the eastern part of the Province, or that part of the Province lying east of a line drawn roughly from Prescott to Ottawa. In our classification above, we have first the underlying rocks which here are chiefly limestones

and sandstones, of Cambrian and Ordovician age, together with igneous rocks of pre-Cambrian age. We have no shales in this part of the Province which can be used in the manufacture of clay products. The result is there are no pressed brick made in this district.

Regarding the next formation, namely the residual clays, nothing further need be said in addition to the discussion above. The residual clays here will naturally have suffered in the same way as those in the West, *i. e.* they would have been completely removed and mixed up with foreign material by the advance of the glaciers, as has been described.

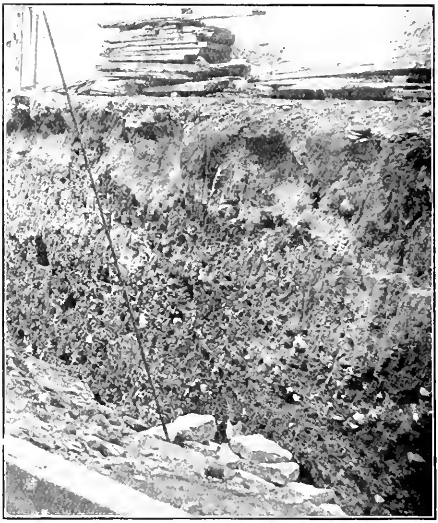

Fig. 23.—Boulder clay on the face of an excavation at Ottawa.

Boulder Clay

We therefore find resting immediately upon underlying rocks for the most part a formation of stiff boulder clay. Concerning this formation, Dr. H. M. Ami says,[1]

"No special formational name or designation has as yet been ascribed to the series of boulder clays which vary in thickness from a few inches or feet, to upwards of 100 feet in thickness, and which overlie the subjacent, glaciated and striated surface of the ancient, Palæozoic rock formations in the Ottawa district. * * * This formation is met with throughout the Ottawa district, and the materials which compose it consist of accumulations of the more or less travelled, broken, ice-scored, and rolled fragments of all the rock formations which the great Labradorean glacier and all its lateral ramifications met along its way, and deposited in its different stages until the close of the glacial period. * * * * These boulder clays, as is well known, were deposited for the most part at the time when land ice prevailed in and about Ottawa; when great accumulations of snow and ice in the form of glaciers, had gathered on the Chelsea hills and north of Ottawa, and spread to the south and carried along whatever loose materials or easily-broken rocks could be detached, in their progress along and deposited them in the valley of the Ottawa, which for the time being must have been filled with rock and ice, as well as the country to the south of the river."

The boulder clay here differs somewhat from that in the West, having many more igneous boulders mixed with it. This is accounted for by the proximity of this area

[1] Geology of the Principal Cities in Eastern Canada, p. 137.

to the igneous Laurentian area immediately north of Ottawa. Again, the eastern boulder clay appears to be distinct and separate from the overlying Leda clay, whereas in the West, the boulder clay appears to pass imperceptibly into the Erie clay. In the East, then, we find an unconformity between the boulder clay and the next overlying formation. This is well shown in a sewer which was being dug in Ottawa during the writer's visit. Here the underlying boulder clay could be seen in the lower parts of the sewer in several places, and lying unconformably upon it was the later formation of Leda clay. Concerning the relation of these deposits, Dr. Ami says that at the close of the glacial period the Champlain period of submergence began. It was at this time that the boulder clay formation was modified and considerably denuded, carried away and redeposited, forming the Leda clay and Saxicava sand overlying.[2]

The Leda Clay

The next overlying formation above the boulder clay is the Leda clay. This corresponds very closely with the Erie clay in the West, but it differs in some respects, one of which is mentioned above, *i. e.* it is a separate formation lying unconformably upon the boulder clay. It has the same blue color, and is a stiff strong blue clay, which at first sight would be taken for the typical Erie blue clay. Upon examination, however, it is found to be quite low in lime, and in this respect is in marked contrast to the Erie blue clay of the West.

ANALYSES OF LEDA CLAYS.

Sample No.	Silica.	Alumina.	Ferric Oxide.	Lime.	Magnesia.	Soda.	Potash.	Sulphur trioxide.	Loss by Heat.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
32	58.54	17.02	5.48	6.36	2.22	2.18	2.95	.56	3.42
33	56.00	17.07	8.27	4.17	4.55	1.81	2.57	.59	4.89
60	57.98	19.00	6.18	3.78	3.82	1.87	3.81	.35	3.18
61	62.06	15.54	5.70	4.91	3.11	1.92	2.38	.14	4.01
62	52.86	17.42	8.85	3.69	3.37	1.85	3.12	.58	8.03
63	52.17	19.40	9.19	3.88	3.72	1.96	3.16	.52	5.65

32.—Leda clay from a bank 14 feet deep, worked by the Cain Brick Co. of Ottawa. Burns to rich red brick

33.—Leda blue clay taken from a similar bank at Morris and Ballantyne's yard at Ottawa. The upper part of this bank is quite sandy, but is mixed with the lower, stronger clay, and yields a rich, red brick.

60.—Leda clay, used chiefly in the manufacture of red tile by William Baker at Arnprior.

61.—Milder clay taken from the same bank and manufactured into red brick, by William Baker of Arnprior.

62, 63.—Samples of Leda clay taken from a very stiff bank, which is worked by the International Portland Cement Co., and used with limestone in the manufacture of cements at Ottawa.[3]

From the above analyses we notice that its percentage of ferric oxide is about the same as the Erie blue clay, viz. about 6 per cent., and this with the low percentage of lime causes this clay to burn to a red color. In many places it reaches a depth about as great as that of the Erie clay. For instance, at Ottawa, where the foundations were being dug for the new Geological Museum, a splendid exposure of strong, blue Leda clay is to be seen. The foundation for this building had to be placed in a bed of this clay, as borings showed it to be 94 feet deep, at this point. Thus in many respects is resembles the Erie blue clay of the west. There is, however, one great difference. The Leda clay was laid down in salt water, whereas the Erie clay was deposited in fresh water. This is proven by the presence of fresh water organisms found in the sands associated with the Erie clay, whereas the shells of marine organisms are found through-

[2] "Geology of the Principal Cities in Eastern Canada," p. 136.

Information and analyses kindly supplied by the chemist of the works at Hull, Que.

out the Leda clay. Dr. Ami reports from this formation the following marine fossils, Leda artica, Mallotus villosus, Fucus digitatus, Byrrhus Ottawaensis, Craniella Logani, and many others, all of which prove that this clay was laid down in salt water.

Towards the close of the glacial period it is believed that a large ice dam formed about Prescott, to Ottawa, turning the fresh water of the upper lakes down through the Hudson river. Thus the water west of this dam was kept fresh by the constant melting of the glacier, whereas east of it the St. Lawrence valley was a wide gulf, which, together with the Ottawa valley was covered with salt water to a height of probably 600 feet above the present water level. In this salt water the Leda clay, which was largely the resorted boulder clay, was deposited. It is therefore now found comparatively free of calcium carbonate, but abounding in the shells of marine life. Through the clay are many glacial boulders which were no doubt dropped from floating ice, as were those found in the cleaner parts of the Erie clay in the western part of tho province.

The Saxicava Sand

We have said above that this Leda blue clay is a strong, stiff clay. This description is correct for the most part, but the upper part of the deposit is quite sandy, so much so that it has been divided, and called by two distinct names, the lower or strong part is called the Leda clay, while the upper, sandy part is called the Saxicava sand. In Geology of Canada, we find the following reference.[4]

"The valleys of the St. Lawrence and the Richelieu in Canada East, and a considerable portion of the region between the St. Lawrence and the Ottawa, to the east of the meridian at Kingston, are occupied by stratified clays; which, unlike those of western Canada, contain abundance of marine shells, for the most part identical with the species now living in the lower St. Lawrence and the Gulf. These clays are in many cases overlaid by sands, occasionally interstratified with clay, which also contain marine remains. The two are regarded as forming parts of one formation. * * * * Dr. J. W. Dawson, who has carefully studied these deposits in Canada, distinguishes the lower as Leda clay from one of its characteristic shells; and the upper, for a similar reason, as the Saxicava sand. He considers the one as having been formed in shallow waters, and the other as a deep water deposit."

Concerning the same formations Dr. Ami says,

"This formation is divisible into two series, one a marine clay, the other a marine sand formation. The 'Leda clay' appears to occupy the lower levels of the St. Lawrence immediately overlying the boulder or glacier clays. * * * * * These clays vary from a few inches in thickness to several feet, reaching 50 feet in certain localities, and also carry boulders disseminated throughout the mass. They are for the most part bluish gray, fine-grained, more or less plastic or stiff clays and muds, * * * * * and hold both vegetable and animal remains in a fossilized condition. * * * * * The Saxicava sand consists for the most part of light yellow and ferruginous sands immediately overlying the Leda clay, of which it may be considered, in a perfectly logical way, as the littoral or shore deposit. It varies in thickness from a few inches to several feet, and is marked by the presence of Saxicava rugosa, Mya arenaria, M. truncata, Macoma fragilis, Macoma calcarea. These are amongst the most conspicuous and characteristic marine organisms."

We thus see that the upper part of the Leda clay, like the upper part of the Erie clay, is usually more or less sandy, but we find more sand associated with the eastern deposits than with the western.

In using this clay, for the manufacture of brick, etc., the upper red clay with the yellowish sand and sufficient of the underlying strong blue clay, are worked together to prepare a proper mix. The upper parts alone, on account of the abundance of sand, would prove too lean, so that a section from 12 to 20 feet is usually worked for the manufacture of brick, tile, etc. A series of analyses is given on page 31, which can be compared with those of the Erie blue clay given on page 14. Nearly all the red brick of the eastern part of Ontario are made from the Leda clay; only a few of those made in the more northerly parts of this area being from a still later formation, namely, the Saugeen.

[4] Geology of Canada, 1863, page 915.
[5] Geology of the Principal Cities in Eastern Canada, p. 163

Saugeen Clay in the East

Overlying the Leda clay and the Saxicava sand we have another clay, which resembles in every way the Saugeen clay of the western part of the province. It bears the same relation to the Leda clay in the East, as it does to the Erie clay in the West. We mentioned above that if a line be drawn from Lake Huron via Walkerton, Paisley, Bracebridge and Pembroke, to Ottawa, then southeasterly to Casselman and on to the St. Lawrence river, it would form roughly the southern border of the Saugeen clay

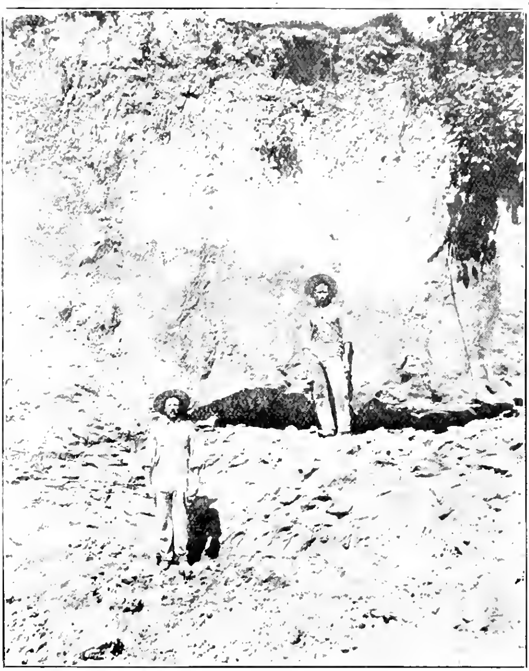

Fig. 24.—Twenty feet of Leda clay, Ottawa. Note strong clay at base ; also weathering of the top along roots, joints, etc.

area. This clay is found in the eastern part from 4 to 20 feet deep, thinly interlaminated as in the West and of similar character, except that it is more sandy in the East than in the West, just as we found the Leda clay more sandy in the East, than the corresponding Erie clay in the West. At the base of this Saugeen series in the East, we find the band of grayish sand, as we did in the West. It also lies unconformably upon the Leda clay. There seems little doubt that all this Saugeen clay was laid down contemporaneously, and represents a deposition of clay in the retreating or melting stages of the glacial period. The sand layers are an evidence of slight flood, whereas the clay layers represent the quieter waters of a less rapid melting, *i. e.* each layer of clay and sand combined would represent the deposition for one season. As in the Saugeen clays of the West, the individual bands of sand and clay are rarely over three-

quarters of an inch in thickness. This Saugeen clay is worked in the East in some of the largest yards, notably at Pembroke, Arnprior, Casselman, Plantagenet, Vankleek Hill, etc., and yields excellent red brick and tile.

The latest clay in eastern, as in western Ontario, would be lacustrine clay, but the writer saw no deposits of this character during his investigations in this part of the Province. No doubt some exist here, but they are purely local in their distribution, and do not need further discussion. They have of course been formed almost entirely from one or other of the clays collected during glacial times.

Physical Properties of Clay

We have now discussed the classification, the distribution, and in a general way the chemical composition of our Ontario clays, but there is another important series of properties which deserve attention. These are the physical properties of clay. By this is meant such characters as plasticity, tensile strength, shrinkage, slaking, fusibility, etc. These are the more important properties considered under this heading.

Plasticity

In our definition above we found that a clay when moistened becomes plastic, which allows it to be moulded or shaped as desired. It has been generally thought that the fatter a clay, the more plastic it would be, while on the other hand the leaner it was the less plasticity it would have. But this is not altogether correct. Some very fine-grained clays, even if quite fat—for example, many washed clays—are nevertheless not so plastic as one might expect from their composition alone. Plasticity seems more closely associated with the fineness of grain in the clay, or in other words, with the completeness of the disintegration of the clay particles, than with the actual percentage of clay material. On this point Heinrich Ries in his report on the clays of New Jersey says:[6]

"A residual clay was compared with a sedimentary clay of the same composition. The residual clay was found to possess less plasticity than the sedimentary clay, the particles of which had been transported long distances and had thereby been more or less rubbed and ground together previous to their deposition. Inasmuch as the kaolinite particles, as shown by the microscope, are more or less bunched, it is to be expected that the rubbing and grinding action during transportation would break up the bunches to some extent, and it is believed that the increased plasticity of the sedimentary clay is due to this cause. This conclusion is in accord with the facts noted by Prof. George H. Cook, who found that by rubbing a mass of kaolin in a mortar the bunches were easily broken apart and that the mass afterwards showed greater plasticity."

Since nearly all our Ontario clays were laid down during glacial times and suffered a great deal of rubbing and grinding action by which each little bunch of clay was pretty thoroughly disintegrated, we are not surprised to see that our Ontario clays, especially the Erie clay, is particularly plastic.

Tensile Strength

The next point mentioned is tensile strength. By this is meant ability to withstand a pulling strain; in other words, ability to adhero when subjected to a pulling test. This is an important property, in that it enables the freshly made brick when air-dried to stand the handling, piling, and to some extent the superincumbent weight to which they are subjected in setting a kiln, although this latter property is more closely associated with a crushing test. The tensile strength is measured by moulding the moistened clay into briquettes, whose shape is about that of the figure 8 and which are made of such a form that their smallest diameter is an inch; their thickness is also an inch. In this way their smallest cross section, and the place where they will

[6]Clays and the Clay Industry of New Jersey H. Ries.

naturally break when subjected to a pull is one square inch. The test is made with a machine so constructed that two brass clips grip either end of the briquette. The strain is then put on and the force required to pull the brick apart is registered on a dial as so many pounds. Our cross section being a square inch, the tensile strength is reckoned as so many pounds per square inch.

It was found impossible to make physical tests of all the clays mentioned in this report from the various yards, but a number were made by the writer at the School of Mining, Kingston, using several examples of each of the clays which have been described in this report. The briquettes were moulded in little brass moulds to the size and shape indicated above. They were then allowed to air-dry until thoroughly dried. They were then placed over coils and afterwards in a hot air bath at a temperature of 105° C. (or 221° F.) One set of tests was made on the clays as taken from the clay banks at the various yards mentioned below. Another set of tests was made on the same clays when the percentage of sand in them had been increased to 33. These tests were made for the purpose of seeing what effect the addition of sand to our clays would have on their tensile strength. As the table below shows, it reduced the tensile strength, but not materially. Moreover, the percentage of sand was a little too great. All these clays were brought up to 33, which is a little too high, but the tests show that the addition of sand up to 25 per cent. would be a great advantage to all of our clays. The advantages of the addition of sand have already been discussed fully in this report, and need no further mention. The tests show that the clays rich in sand have a lower tensile strength, but here again we find that the very finest grained clays, as was the case in plasticity, are also low in tensile strength. From this it appears that too great a percentage of coarse material, for example, sand, or even too great a percentage of the finest material, or in other words a clay almost free from sand, has a small tensile strength, while the clay of intermediate composition, that is, a clay with a fair proportion of sand, say 25 per cent., gives the most desirable results. The numbers used in the following tables are the same as used under the lists of analyses, so that the locations can be identified under the lists of analyses for each class of clay mentioned.

TENSILE STRENGTH OF CLAY BRIQUETTES UNBURNED.

No.	Class of Clay.	Percentage of sand contained.	Strength of Sample 1.	Sample 2.	Average strength
2	Erie	15	190	165	178
2	"	33	140	140	140
3	"	25	100	90	95
3	"	33	60	70	65
8		15	155	130	142
8	"	33	115	130	122
12		24	115	120	117
12	"	33	100	100	100
25	"	14	120	130	125
25	"	33	140	115	127
27	"	15	120	115	117
27	"	33	90	105	97
30		20	120	135	127
30	"	33	60	65	62
31		27	140	130	135
31		33	115	150	132
5	"	21	150	165	157
5	"	33	120	130	125
1	Red-top	40	145	160	152
1	"	33	140	155	147
7	"	30	130	125	127
7	"	33	175	180	177
29	"	23	190	170	180
29	"	33	170	180	175

TENSILE STRENGTH OF CLAY BRIQUETTES UNBURNED.—*Continued.*

No.	Class of Clay.	Percentage of sand contained	Strength of Sample 1.	Sample 2.	Average strength.
34	Saugeen	21	155	170	162
34	"	33	135	200	167
35	"	27	160	185	172
35	"	33	135	155	145
59	"	17	145	170	157
59	"	33	130	110	120
32	Leda	21	140	115	127
32	"	33	120	110	115
33	"	21	200	190	195
33	"	33	200	180	190

TENSILE STRENGTH OF BRIQUETTES BURNED.

Sample No.	Class of Clay.	Percentage of Sand contained.	Strength of Sample 1.	Sample 2.	Average strength.
2	Erie	15	250	210	230
2	"	33	250	265	257
3	"	25	320	365	342
3	"	33	270	290	280
5	"	21	250	270	260
5	"	33	340	290	315
8	"	15	290	325	307
8	"	33	340	325	332
12	"	24	200	180	190
12	"	33	200	285	242
25	"	14	300	340	320
25	"	33	390	300	345
27	"	15	210	170	190
27	"	33	200	230	215
30	"	20	225	300	262
30	"	33	210	240	225
31	"	27	220	265	242
31	"	33	215	290	252
1	Red-top	40	300	310	305
1	"	33	280	295	287
7	"	30	320	295	307
7	"	33	326	300	310
29	"	23	380	350	365
29	"	33	320	350	335
34	Saugeen	21	350	375	362
34	"	33	300	330	315
35	"	27	330	350	340
35	"	33	360	400	380
59	"	17	235	270	252
59	"	33	200	210	205
32	Leda	21	290	260	275
32	"	33	230	180	205
33	"	21	295	320	307
33	"	33	125	150	137
9	Shale	19	430	470	450
18	"	25	360	310	335
21	"	20	370	365	367
22	"	19	540	500	520
23	"	33	370	400	385
24	"	20	580	610	595

It will bo noticed from tho above figures that increasing the percentage of sand lessened in almost every case the tensile strength of the raw clay, but not very materially. The addition of the sand is consequently a great advanatge, in that it aids the working of these clays, reduces the shrinkage both in drying and burning, and assists also in the burning by tending to keep the brick in its original shape.

From the second set of figures, that is, the tests of the tensile strength of the same clays when burned into briquettes, it is evident that the addition of sand again reduced in about half of the cases, the tensile strength of the resulting briquette, while in a corresponding number of cases it increased the tensile strength of the burned brick. This would indicate that the addition of sand to our Ontario clays is a great help to them. It was pointed out above that the addition of sand up to 33 per cent. was a little too much, but the addition of sand up to 25 per cent., that is one part of sand to three parts of clay, makes a first-rate mix. Notice No. 3, 1, 7, 29, 34, 35 and 33. These clays each contain about 25 per cent. sand in their natural state, and the tensile strength of the burned brick made from them is the highest, or about the highest, in the list. The tensile strength of the six shales is high. This is probably due to the uniformity of the material, and to the even grain of the finely pulverized shale.

From these tests it is clearly evident that the addition of sharp clean sand to about one-quarter of the whole bulk is a great advantage to our clays. The many advantages have been mentioned in this report several times, but it is necessary to correct the prejudice prevailing in a great many minds, that the addition of sand to clay is an adulteration which depreciates the value of the clay. As will be seen from the above tests this is not true. Of course this addition of sand must be made judiciously and should not exceed 25 per cent.

After making the tests of tensile strength of our clays, the writer thought it advisable to make a few tests of the crushing strength, that is, the ability of burned clays or brick to withstand pressure of burden placed upon them. For this purpose small bricks were made in the shape of a cube, each of whose edges would be one inch. In his way, the test pieces were one cubic inch, and the surface exposed to the pressure was one square inch. The small bricks or blocks were then placed between the jaws of a crushing machine and pressure applied. These tests were made in the cement testing laboratory of the School of Mining, Kingston, by Prof. A. McPhail, and the results are given in the table below. It might be added that for comparison's sake tests were made of well-burned red face-brick as sold in commerce, and these gave on an average of four tests, 2,460 pounds to the square inch. This figure is given as a standard for comparison.

CRUSHING TESTS ON CUBES BURNED.

Sample No.	Class of Clay.	Percentage of sand contained.	Strength of Sample 1.	Sample 2.	Average strength.
2	Erie	15	3,150	2,820	2,985
2	"	33	3,790	3,700	3,745
3	"	25	1,875	1,765	1,820
3	"	33	967	925	946
5	"	21	2,783	3,340	3,061
5	"	33	2,640	3,060	2,850
8	"	15	2,900	2,580	2,740
8	"	33	2,510	2,310	2,410
12	"	24	3,190	3,390	3,290
12	"	33	3,050	3,010	3,030
27	"	15	2,620	2,760	2,690
27	"	33	2,310	1,675	1,992
31	"	27	1,465	1,480	1,472
31	"	33	1,965	2,440	2,200

CRUSHING TESTS ON CUBES BURNED.—*Continued.*

Sample No.	Class of Clay	Percentage of sand contained	Strength of Sample 1.	Sample 2.	Average strength.
1	Red-top	30	2,410	3,195	2,802
1	"	33	3,740	3,220	3,550
7		30	2,610	3,020	2,815
7		33	2,460	2,600	2,530
29		23	2,310	225	2,617
29		33	3,390	3,570	3,480
34	Saugeen	21	4,360	4,720	4,540
34		33	3,800	3,740	3,770
35		27	2,990	3,390	3,190
35		33	3,400	2,760	3,080
59		17	4,480	2,390	3,435
59		33	1,960	2,400	2,180
32	Leda	21	2,760	3,190	2,975
32		33	3,615	2,880	3,247
33		21	3,250	3,580	3,415
33		33	4,610	3,020	3,815
9	Shale	19	3,710	3,410	3,560
18		25	3,640	4,370	4,005
21		20	4,740	5,340	5,040
22		19	5,660	6,510	6,085
23		33	4,600	4,060	4,330
24		20	9,200	6,290	7,745

From the above table it will be readily seen that the addition of sand up to 33 per cent. does not materially affect the ability of these clays to withstand pressure, or to carry loads, when burned to good hard brick, so that it is again demonstrated that the addition of sand, within reasonable limits—up to say 25 per cent.—is a decided advantage, and not a detriment, especially when we remember the increased facility in working that the addition of sand to a clay gives.

The table also shows the great carrying power of bricks made from shale. Probably this is caused by the homogeneity of the raw material, resulting in a brick of perfect uniformity, whereas in making brick from clay it is impossible to get the product absolutely homogeneous. Sand was not added to these shales since they are all worked by the dry method for the manufacture of pressed brick, and the addition of sand in this process would not only be much trouble, but would be hard on the machinery on account of its grinding action.

Shrinkage

The next physical property mentioned was shrinkage, and under this heading we have to consider two phases, one known as air-shrinkage and the other as fire-shrinkage. Whether brick are made by the soft-mud, stiff-mud, or even the dry-press method, they contain more or less moisture. This moisture is disseminated throughout the clay around and between all the particles. After the brick are made they are set to dry by one or other of the methods mentioned below. In the drying process the moisture leaves the interspaces and the particles of clay come together to take the place of the water. This means a shrinkage in the size of the brick as a whole, and this is what is meant by air-shrinkage. See fig. 70.

But even when this moisture has been driven off and the little particles of clay touch each other they do not form a perfectly compact mass, for there are still small spaces amongst the grains in which the water can lie, and this moisture remains until

driven off by heat. This is the moisture that escapes during the "water-smoking," or "steaming" as it is often called by brick-makers. There is even yet additional moisture present in the chemical make-up of the kaolin, which is not driven off until the heat reaches 400° C. (752° F.) This causes the greater part of the fire shrinkage, although other things, such as the loss of carbon dioxide, etc., from clays rich in lime, have their effect. The amount of shrinkage which a clay will undergo is lessened by the addition of sand. The air shrinkage is low in lean clays and high in very plastic clays. Soft-mud brick usually shrink more than stiff-mud brick because the former are mixed with more water and are not pressed so compactly as the latter. At the same time soft-mud brick, which contain considerable sand, shrink less than soft-mud brick which contain less sand. This is a matter of experiment, and clearly proves that the addition of sand within certain limits, is a decided advantage from the standpoint of drying the brick, and preventing excessive shrinkage which so often causes the brick to crack or shake, thus pulling themselves to pieces. The kind of sand used, that is, whether coarse or fine, or its color, etc., does not matter much so long as it is clean, that is, free from limestone and organic impurities.

Slaking

Another physical property of considerable importance is slaking. If a lump of clay, however hard, be moistened, it will slake or break to pieces. Sandy clays powder up more readily, whereas the fat or strong clays will slake very slowly, and sometimes may only scale or chip off gradually. This property of slaking is of considerable importance, because it forms a method of thoroughly disintegrating the clay. Many of our clay-workers take advantage of it by digging up their clay in the fall, and letting it lie over winter exposed to the rains and frosts. In the spring when the frost has left it, it will be found to powder readily, and can be dug and wheeled directly to a machine even without the use of a pug-mill.

This property of slaking is of a special advantage to those brick-makers using the Saugeen clay. This clay, as we have seen, occurs in layers, and when dug breaks out into large stiff lumps or cakes; in many cases also it has nodular concretion-like forms enclosed in it. Upon exposure to the air, however, these lumps and cakes break up completely. Many of the brick-makers do their tempering and mixing the sand with the clay by this process. The clay and sand are dug and dumped in layers in a heap. The clay afterwards slakes so completely that when the heap is dug over the clay and sand are very readily mixed, and can be sent directly to the soft-mud machine without having to be put through a pug-mill at all, although a pug-mill is always of the greatest advantage in tempering clay.

Fusibility

The last physical property mentioned in our list was fusibility. After the clays have been water-smoked and as the heat continues to be raised, as soon as a temperature of about 400° C. is reached, the combined water is given off. After this point is passed and the heat raised to about 900° C., or perhaps a little higher, the particles of clay fuse and knit to each other, forming a perfectly coherent mass which on cooling retains its hardness. In the manufacture of ordinary brick this fusing temperature must not be passed, or the brick will become viscous and the whole mass will fuse together into great lumps within the kiln. It is therefore important that brick should be burned till incipient fusion begins, but not materially above this point.

In order therefore to test a kiln, or to be able to control the temperature, an excellent method was devised as far back as 1886, by Dr. Herman Seger. This consists in the preparation of a series of pyramids or cones known as Seger cones. Their preparation and use is well described by Prof. Edward Orton of Ohio State University, Columbus, Ohio, from whom the cones may be had at one cent each. In a pamphlet advertising these cones Prof. Orton says:

"The fundamental idea of this system is to prepare a series of silicate mixtures which melt in progressive order, from a low temperature to a high one, and then to use these melting points as a scale for comparison in the burning processes of the clay industry. * * * * It has been clearly proven that the Seger cone is the best, the most accurate, and most reliable means of controlling the burning process of clays. The cones should be set erect on a slab with plastic clay. The clay should be refractory enough to stand the heat of the kiln without melting. Place the slabs of clay, each containing an assortment of cones running from low numbers up to high numbers, in different parts of the kiln you desire to test. When the burn is over and the kiln is drawn note the condition of the cones. If the heat range covered by the cones was large enough some of the cones will be melted flat, others bent over, others erect and unaffected. Suppose that numbers ranging from 08, 07, etc., down to 1 were used, and suppose that Nos. 08 to 03 were down flat and 02 was bent, but not completely melted, while 01 and 1 were practically unaffected. The required tempera-

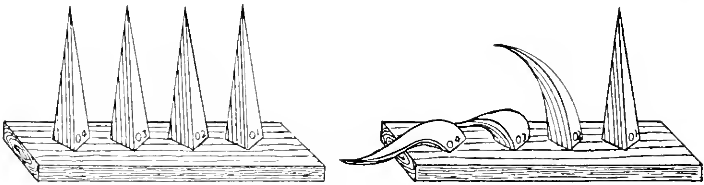

Fig. 25.—Examples of Seger cones (1) placed for fusion test, (2) after fusion test, etc.

ture would be recorded as 02. If other slabs in other parts of the kiln all show the same result, we would conclude that the temperature reached was quite uniform throughout the kiln, and if the burn turned out a good one we would conclude that cone No. 02 indicated the proper finishing point for our conditions, *i. e.*, 1110° C. (or 2030° F.) Having determined the proper cone, say 02, to continue our illustration, it should always be used for every burn as follows: Make up slabs containing cones 04, 03, 02 and 01. Make several of these slabs so that they can be placed in several parts of the kiln in view of peep holes. When the first cone 04 does down it is a warning that the heat is approaching the proper point. When 03 goes down get control of your fire so that if 02 begins to bend you are prepared to check the heat quickly so as to prevent over-firing and fused kilns."

We thus see that in our kilns the cones required would not exceed 30 or 40, and as we have pointed out the cost of the cones is one cent each, so that the extra security obtained, and the closer check on the burning is worth many times the cost.

These cones were used by the writer in testing our Ontario clays, and it was found that in most cases clays fused between cones 08 and 05, so that in buying cones the numbers required in Ontario would vary between 010 and 02.

TABLE OF OFFICIAL MELTING POINTS OF CONES.

Cone No.	Degrees Centigrade.	Degrees Fahrenheit.	Cone No.	Degrees Centigrade	Degrees Fahrenheit.	Cone No.	Degrees Centigrade.	Degrees Fahrenheit.
010	950	1742	5	1230	2246	19	1510	2750
09	970	1778	6	1250	2282	20	1530	2786
08	990	1814	7	1270	2318	21	1550	2822
07	1010	1850	8	1290	2354	22	1570	2858
06	1030	1886	9	1310	2390	23	1590	2894
05	1050	1922	10	1330	2426	24	1610	2930
04	1070	1958	11	1350	2462	25	1630	2966
03	1090	1994	12	1370	2498	26	1650	3002
02	1110	2030	13	1390	2534	27	1670	3038
01	1130	2066	14	1410	2570	28	1690	3074
1	1150	2102	15	1430	2606	29	1710	3110
2	1170	2138	16	1450	2642	30	1730	3146
3	1190	2174	17	1470	2678	31	1750	3182
4	1210	2210	18	1490	2714	32	1770	3218
						33	1790	3254

PART II.—THE MANUFACTURE OF CLAY PRODUCTS

The uses to which clays and shales are put are varied and widespread, and only those which are of more importance in Ontario will be considered. Among these the manufacture of brick, whether face, common, or pressed, plays the most important part. Other uses are the manufacture of hollow-block, terra cotta, roofing tile, drain tile, sewer pipe, paving brick, chimney flues, terra-cotta lumber, pottery, and Portland cement. Brick are made in Ontario from all the classes of clay mentioned above, as well as from the various shales, these latter being used in most cases in the manufacture of pressed brick.

In brick manufacture there are three processes known, (1) the soft-mud, (2) the stiff-mud, and (3) the dry-press; and all three processes are in use in Ontario. We will consider these in order.

Mining the Raw Material

The clay is as a rule simply dug with pick and shovel and transported by cart or car to the machine. In other cases, the clay is dug at the end of the brick-making season and thrown in a heap, where it is allowed to freeze and disintegrate throughout

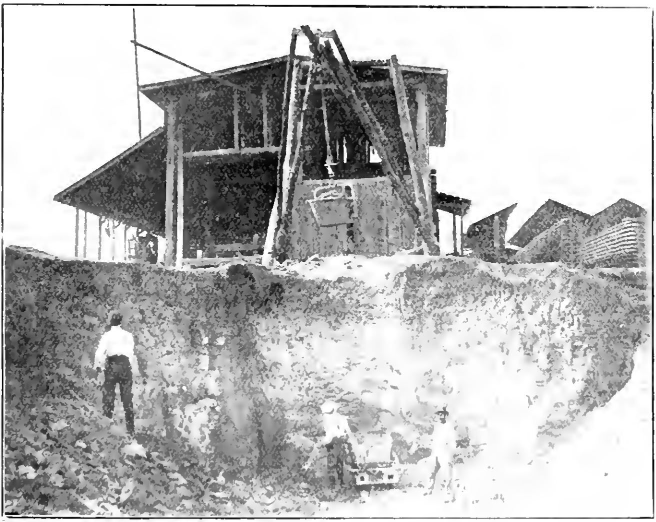

Fig. 26.—A novel method of mining and transporting clay from pit to machine; Watson and Hutchison's yard, Bracebridge.

the winter. This serves to thoroughly break up the clay, and in the spring it is taken direct from this heap to the machine. In still other cases, the clay is collected by an automatic clay-gatherer, which is a revolving drum, hauled by a team of horses, and in passing over the clay bed, loads itself. This method of clay gathering is confined however, to dry clay, when the horses are driven over the surface of the whole bed of clay

In mining the shale, it is always necessary to blast. This is done in the usual way, by drilling a hole, either by hand or with machine drill, to a suitable depth. The hole is then charged with powder or dynamite, and blasted in the usual way. In some cases the surface of the shale, which on exposure to the air powders up or slakes is simply ploughed, and on being left, thoroughly disintegrates to a powdered form which can easily be worked in the machines. Those shales which are blasted require crushing before they can be used in any of the classes of machine used for brick-making. This crushing may be done in one of three ways. First, by passing the shale through a pair of jaw crushers, but this method does not produce a product of even grain, and is therefore unsatisfactory. A second method in more common use, is the use of rolls. These consist of two steel rolls, usually of unequal diameter, revolving in opposite directions, and with different velocities. The surface of the rolls may be smooth, corrugated, or pebbled. This machine works much better, but its capacity is not great enough. It is especially useful for clays which contain a few pebbles, as it crushes

Fig. 27.—Clay brought over the tops of the hacks by clay cars and cable, F. Entricken's yard, Stratford.

these, but allows the pieces to mix throughout the clay. The third, and most satisfactory method of crushing the shales, is the pan-mill, which consists of a large pan with a perforated steel bottom, so that the ground material may fall through when sufficiently pulverized. In the pan two large roller-like wheels revolve by the friction of the pan which turns below. The pan in turning carries the pieces of shale beneath these rollers, and these crush by their weight, which ranges from one to two tons and a half per wheel. Two scrapers are placed in front of the rolls, to throw the material in their path. A machine of this kind has capacity of eight tons per hour, or better.

Ridding the Clay of Stones

One method for removing the stones, is to crush them, but this is not very satisfactory, especially if the pebbles be limestone, for the pieces whether large or small remain in the clay, and on burning are converted into lime, which invariably expands, bursting the brick. The only proper method is to remove the stones entirely, and

this is a difficult problem. A first-class machine for the removal of stones from ordinary sun-dried clay, is the Bechtel disintegrator, manufactured by Bechtel Brothers, of Waterloo, Ontario. The stones here are removed by centrifugal motion, by which the stone, being heavier than the clay, is thrown to the outside, while the lighter pulverized clay works down, passing out through the bottom. This is an excellent machine, but can only be worked on dry clay. The only method in use in Ontario for the removal of stones from wet clay, is washing. The clay is dug and dumped into a circular pit, which may be from twenty to thirty feet in diameter, about three feet in depth and lined round the side with boards or brick. In one side a sluice-gate is left, which can be closed or opened at will. The clay is thoroughly wet, and round and round the pit a horse travels, turning a beam on which may be hung drags or wheels, which will thoroughly mix the water and clay. In a very few hours the whole of the mass will be thoroughly mixed and the stones will have settled to the bottom. The sluice-gate can then be opened and the upper soft clay slurry can be run off to a clay dump. This process at once removes the stones, and thoroughly tempers or mixes the clay. The cost of this operation will not exceed 35 cents per thousand of brick, and in every case adds at least 50 cents per thousand to the price obtainable as compared with bricks even from the same yard, made of unwashed clay.

Tempering

By tempering the clay is meant mixing it with sufficient sand, loam or other material to render it less strong or fat, and thereby bring it to a workable consistency.

The materials added to clay for this purpose, are often spoken of as "grogs," and many different kinds are used according to the ease with which they can be procured. Sand is by all means the best, as it mixes thoroughly with the clay and does not have any effect on the brick in burning, as the sand itself does not fuse. Unfortunately, however, sand cannot always be procured within reasonable distance, and then resort must be had to other means. In many cases a mild loam is used for red brick, and it not only tends to make the clay less strong but also improves the color of the brick by deepening it. In other cases, ground brick-bats are used, that is all the broken brick of the yard are ground up and added to the raw clay.

It is a serious mistake to use a strong clay without something to temper it, for the brick will almost invariably crack either in the drying or burning. Most of our Ontario clays, unless the bank be already sandy, will stand from a quarter to one-third their bulk of sand or other grog. In other countries, saw-dust, ground coal, charcoal, etc., are used.

The tempering may be done on an old mixing floor, which was the earliest method, by simply digging the clay over with a shovel. This has now been largely replaced by more modern methods. One of these is the ring pit, a description of which was given above in connection with the removing of stones by washing. Another process, still used to some extent, is the soak pit. The clay with its mixture of sand, etc., is dumped into a pit, a good supply of water poured over it, and the whole allowed to soak over night. This thoroughly softens the clay but does not in any way mix it. This has to be done entirely in the machine, and is not at all satisfactory. Both of these methods require so much handling and labor that new methods employing machinery have replaced them almost entirely.

The best of these is the pug-mill. This consists of an ordinary steel semi-cylindrical trough, which may be of any length, but usually from five to eight feet. Running lengthwise through the trough is a shaft on which are a number of knives or blades, set at such an incline that in revolving they mix the clay, sand, etc., thoroughly and at the same time keep feeding it along the trough towards the exit. Here the clay can be wet and tempered to the exact consistency desired. The machines take about six horse power and very little space, and can be placed so as to discharge directly into the moulding machine. They have therefore replaced almost all other methods of tempering.

Moulding

In discussing moulding we have now to consider the three processes of brick manufacture mentioned above, that is the soft-mud, stiff-mud and dry-press.

In the soft-mud process the clay, sand, etc., are mixed with sufficient water to make a soft mud. This is forced into moulds the shape of a brick. But since this soft mud would stick to the sides of the mould, they must be sanded each time before being filled. The earliest method was hand-moulding, that is a small mould was filled by hand, scraped off, and dumped, the mould resanded and filled again as before. This was the old method of brick making, and is still in use in a very few yards.

It is very slow, so that machines have been devised which will mould five or six bricks at a time. This machine consists of an upright box, either wood or iron, within

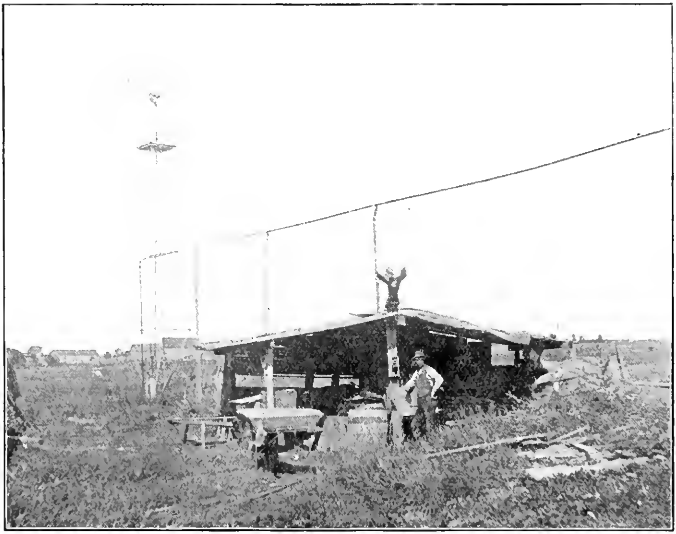

Fig. 28.—Hand moulding plant, Mouldy Bros., Kingston; one man moulds 2,000 brick per day.

which is a vertical shaft set with blades which mix the clay and at the same time force it downwards. At the foot of the shaft is a large arm with a flat face, which forces the clay into the press box. As each mould is filled it is automatically shoved out of the machine, where a man scrapes the whole mould free of surplus clay, then lifts the mould and dumps the six brick, when it is ready for re-sanding and filling again.

The sanding is sometimes done by hand, but is usually now done by machine. The sanding machine consists of a trough-like steel cylinder in which are a number of blades. The mould is dropped in, and one of these blades catching the mould carries it around with it in a revolution. The bottom of the cylinder is filled with dry sand, and the mould in passing through it is thoroughly covered.

In the stiff-mud process the bricks are not moulded into shape in individual moulds, but a column of clay is made and is cut off into the required shape. The clay is

tempered with less water and is consequently quite stiff, as the name would indicate. This clay is thrown into a cylinder-like machine, larger at one end than the other. Within this machine a shaft revolves on which blades are set, which form an auger. At the smaller end of the cylinder a steel die is placed, and through this the clay is forced by the auger movement within the cylinder or barrel. The shape of this die is varied according to the class of article produced, that is, a column of clay may be required which can be cut along the largest face into brick, that is the brick would be cut along their broad, flat faces. These are known as side-cut brick; or again a column of clay may be required which can be cut across the ends into end-cut brick; or again even rectangular hollow bricks or blocks may be required; in all these cases the nature of the die can be changed to suit the requirements.

On account of the very solid nature of the stiff-mud clay, a great deal of friction against the sides of the die results, so much so in fact, that the outside of the column of clay is retarded more than the centre, which interferes seriously with the uniformity of the resulting brick. To overcome this trouble, the die is often heated by steam, a hollow jacket around the die serving for this purpose. Or again, it may be lubricated the oil being fed through small apertures or cuts facing the front of the die, so that the clay cannot enter them.

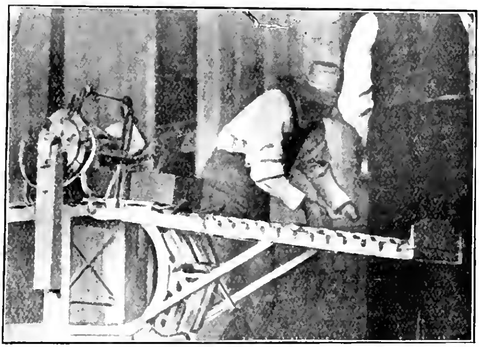

Fig. 29.—Bechtel automatic end-cut cut-off machine in operation at Stratford Brick, Tile and Lumber Co's yard.

The column of clay on leaving the die is cut into brick by means of a stiff wire. In the first or side-cut machines, these wires, usually four in number, are set on a frame, and when sufficient clay has passed through the die to make four brick, the frame is drawn across the column of clay and the brick are lifted off. For side-cut brick the wires are sometimes increased to eight.

Recently, two or three methods of automatically cutting off the brick, have been devised. The first of these consists in a large frame with eight or more wires attached, which can pass from side to side across the column of clay. When the bar of clay has issued to a sufficient distance to press a lever, the frame is forced to cross and the brick are then removed in the ordinary way. The method is used chiefly in the side-cut process. A new and improved method is now used for both side-cut and end-cut brick. This consists of a delivery table, the floor of which is a series of small rollers. As the clay is shoved over these, the machine is operated, so that it makes no difference at what rate the column of clay comes from the machine, the speed of the cut-off is regulated by it. A spool-like reel is set above the column of clay, and on each bar of

the reel a wire is stretched. As the clay passes beneath the reel, these wires are forced through the column, cutting it up into end-cut or side-cut brick as required. The machine is manufactured by Bechtel Brothers of Waterloo.

In the moulding of dry-press brick we have the clay almost dry, as the name would indicate. Thus the shape of the brick has to be produced entirely by pressure. As we have seen above, dry-press brick are usually made from shale, which requires to be ground up by one of the processes described above. This dry or nearly dry pulverized shale or clay is then fed into steel moulds, which are heated by steam to prevent the clay sticking to the mould. A plunger descends, pressing the clay into the mould, at the same time the bottom of the mould rises, so that all the pressure will not be exerted on one face of the brick. A pressure of about eighty tons is thus put upon each brick, four being made at a time. As the plunger rises, the made brick are shoved ahead and the moulds are refilled. A machine capable of making four bricks at a time is made by the Berg Company of Toronto, and has a capacity of about twenty thousand brick for a day of ten hours.

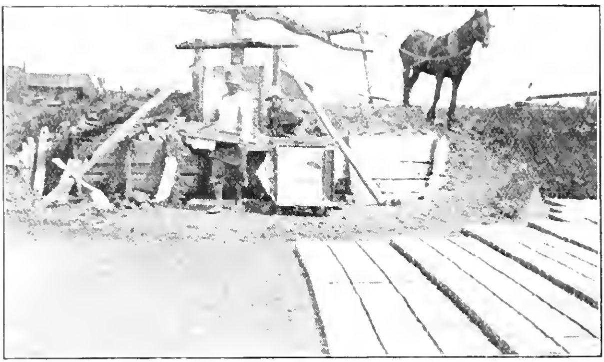

Fig. 30.—Slop-brick plant in operation, Crediton. The brick are dried in the open yard as shown in the photo.

The great advantages of the dry-press process are, that with one operation there is produced a dry, hard brick with sharp corners and edges, and one capable of carrying an immense load. It is thus especially well adapted to large buildings with high walls.

We occasionally find that soft-mud or stiff-mud bricks, after their preliminary moulding are considerably improved by being subjected to a re-press process. This requires the use of a small steel mould about the size of an unburned brick, which has a movable top and bottom. The brick can be placed in this and subjected to a re-pressing process, the top being lowered by means of a screw and the bottom raised by a screw or lever. Most of these machines used in Ontario are small hand-power machines, with which a man, with a helper, can re-press about 3,000 brick per day. The stiff-mud brick can be re-pressed at once at the time of moulding, but the soft-mud brick have usually to be dried from three to six hours before being subjected to the re-press process. This method is not much used, unless a very few choice face brick are required, and the dry-press brick have practically made the re-pressing of ordinary brick entirely unnecessary. The chief value of re-pressing was to straighten the edges, square the corners, and to increase to some extent the strength of the brick.

Drying

Brick that are made by either the soft-mud or stiff-mud process have to be freed from most of their water before they can be burned. This is done in several ways. The original method of drying brick and that still used in hand-moulding yards, is to simply lay the brick on their flat surfaces on a level sanded yard, and allow them to dry in the sun. The moulds containing the soft brick are turned out on this yard, and the brick are allowed to dry here for five to eight hours, when they will be sufficiently dried to stand handling. They are then picked up and "hacked" out in the ordinary way. This method is cheap, but has several disadvantages. It requires too much yard space and extra handling, and should a shower of rain fall on the brick they are spoiled entirely. Once the brick are hacked they can be covered by hacks or a few loose boards, but it is a common thing to see a whole yard of bricks spoiled by an hour's rain. This method then, is almost entirely displaced by new processes of drying.

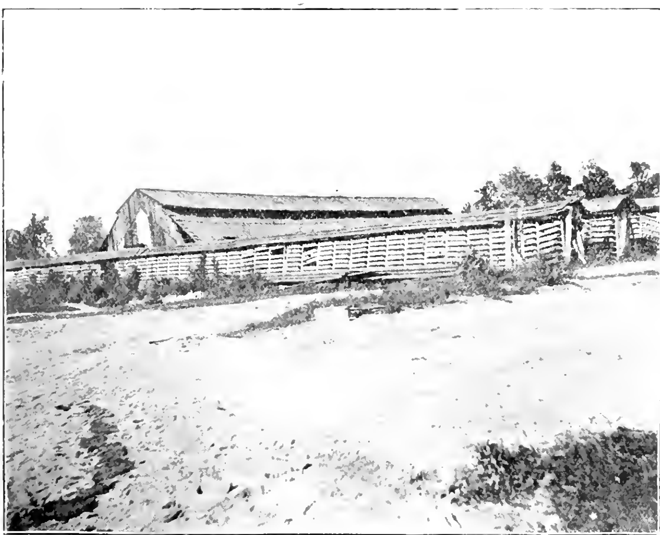

Fig. 31.—Rack and pallet yard, Cain Brick Co's yard, Ottawa. The kiln shed is in rear.

The first advance over the old method is the covered yard, that is, a series of narrow scoop-roofs are so arranged that they can be thrown open to the sun or quickly closed down in case of rain. They are commonly pivoted, so that they can be turned to any position to meet a storm from any quarter whatever. Their chief disadvantage is that a driving rain will beat under the edges of the roof, and spoil several of the lower courses of brick. A further disadvantage is, that each brick has to be laid or hacked separately, and this not only is rather slow work, but requires considerable skill, and it is not easy to get men to do this part of the work.

The result is, that a new system of drying, known as the "rack and pallet" system has almost entirely replaced the open hack-yard. For this new system a series of covered frames is erected about five feet and a half in height, and from one hundred

to two hundred feet long. Beneath each of these roofs cleats are so placed that from seven to ten pallets, each capable of holding six brick, can be set like a series of shelves, to dry. When the brick are dried they are lifted from these pallets, and taken to the kilns as usual, while the empty pallets are returned to the machine to be refilled. This yard has the special advantage of being easily handled, as anyone can lift a pallet from the barrow ,and place it on the rack. The chief disadvantage is that it requires a large number of pallets, but as these are made from rough lumber or strips of any kind, lath for example, and do not wear or get destroyed in any way, they are not expensive.

These are the only systems of open air drying in use in Ontario, but there are other systems of artificial drying which are becoming quite popular. The first of these in the tunnel dryer. For this system a yard is supplied with cars, capable of holding from three hundred to three hundred and sixty newly made brick. These care are

Fig. 32 —J. Logan's yard, Greenwood avenue, Toronto ; showing Sheldon dryer and down-draft kiln.

loaded at the machine; they are then run into a tunnel, closed in on all sides, and through the tunnel a blast of warm air is forced by a fan. The wet brick enter at the cool end of the tunnel, and as car by car of dry brick are taken from the opposite end of the tunnel, these damp brick are brought nearer and nearer to the hot blast. In this way the wet brick are prevented from being cracked and checked by being exposed directly to a hot dry blast This forms a very good system of drying, its only disadvantage being that it requires a large number of cars, since the brick are not unloaded from the time they leave the machine till they reach the kiln yard. But as these bricks can be dried in thirty-six to forty-eight hours, the rapidity with which the brick are dried, counteracts to a great extent the disadvantage of requiring so many cars. This system of drying is installed by the Sheldon & Sheldon Co., of Galt, Ontario, and is the best system for drying ordinary stock brick seen in the Province.

Another system of drying is known as the Bechtel Carless Dryer, which overcomes the difficulty of providing so many cars. A series of three or more shallow trenches are made in the floor of a shed, well closed in. Into the end of these trenches a blast of warm dry air is forced by a fan, and by means of dampers the blast can be turned into one or other of these trenches as desired. The newly made brick, if made by the stiff-mud process, are piled on a single pallet, say eighty to one hundred brick, or if made by the soft-mud process each mould is dumped on a separate pallet, and eight to twelve pallets are piled one on another in a heap. Lifts on the ends of the pallets prevent them from touching the under brick. These piles of brick are then wheeled in by a specially devised truck, and are set in a row over one of these trenches. They are then covered by a loose canvas and the blast of air is turned into that trench.

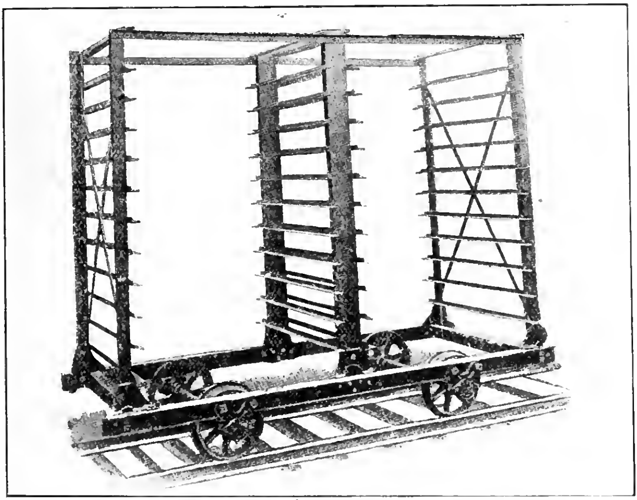

Fig. 33.—One of the steel cars used in the Sheldon and Sheldon tunnel dryer, capacity about 330 brick.

This air distributes itself from end to end throughout the trench, and in rising through the moist brick escapes through the loose canvas, thereby drying the brick. This method is especially well suited to the drying of wire-cut brick, as it combines quick handling and rapid drying with few pallets required. Furthermore, the brick when dried can be picked up by these trucks, eighty to one hundred at a time, and wheeled to the kilns. This dryer is made by Bechtel Bros. of Waterloo, Ontario.

The only other system of artificial drying in use in Ontario is the open floor dryer. This consists simply of an open floor, beneath which are placed a series of iron pipes, or a series of flues, or even a blast of warm air may be blown. The heat and accompanying rising air passes up through the floor and dries the brick. This method is not in much use, as it is too expensive and where employed at all only the exhaust steam is used. This system is somewhat used in the drying of tile. For brick, the distribution is too unequal, and too much labor is required in handling the brick.

Burning

The last step in the manufacture of brick is the burning. After the brick have been dried by any of the methods mentioned above, they are wheeled in to the kiln-yard, where they are placed for burning. The commonest method for burning, is in the open-shed scoved kiln, or as it is commonly called, the Dutch clamp kiln. For this method a perfectly dry kiln-ground is required. This can be easily attained by drainage, etc., or if the ground is slightly damp, a couple of courses of burned brick may be used as a floor, or what is cheaper and quicker still, a layer of tar paper may be used to good advantage. On this the dried brick are piled, leaving spaces on all sides through which the heat may rise freely. Fire arches are built of the unburned brick, to a height of two feet and a half to three feet at the crown, the arches being usually placed the length of four brick from each other, and run right through to the opposite side of the kiln. The brick are set on edge and are piled thirty-two to thirty-six courses high, air spaces being left all through the kiln. There are many different methods of piling these brick, the commonest of which is to pile the brick

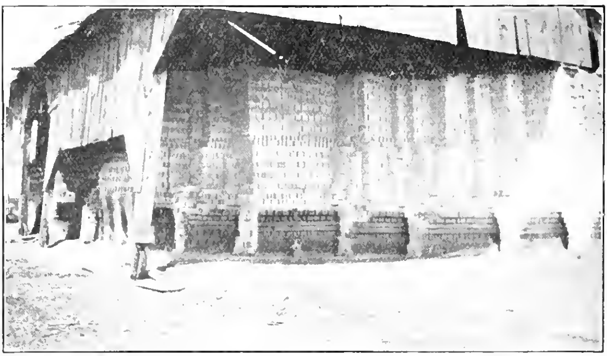

Fig. 34.—Open shed scoved kiln, showing method of setting and nature of arches. Note wheels on base of uprights of shed, to enable it to be moved over the kiln ground from kiln to kiln; W. Hedden's yard, Crediton.

six on two, that is six sideways on two lengthwise, and dividing the space proportionately. Around the outside of the kiln the spaces are usually made greater, as it is difficult to get the heat to the outside, the tendency being to chimney in the more central parts of the kiln, which would leave the outside brick soft. No attempt will be made to describe how these brick should be piled, as no two brick men are entirely agreed on this matter, but each one varies the piling to suit the particular behavior of his clay. When the kiln is built, an outside cover or "scoving" of burned brick is placed round all four sides, wider at the bottom than at the top. The top of the kiln is left open, or is at least covered loosely with a floor of burned brick, known as the "platting." Around all four sides, outside of the scoving of burned brick, a coating of wet mud is placed, which prevents the heat from escaping through the sides, and also prevents the entrance of any cold draught through the sides of the kiln. In this way the whole kiln can be raised to a temperature of 2,000° Fahrenheit. Over the kiln, an open shed is usually built, to prevent the rain from chilling the brick, and from washing off the mud from the scoving, which would then admit cold air. When the kiln is burned, this scoving is torn down, when the burned brick can be shipped as

required. This building up and tearing down of the scoving each time entails a great deal of labor and expense, as it requires a great many brick and most of these are soon broken and rendered useless. Hollow blocks are now used to a great extent instead of brick for scoving, with the advantages of quicker building and tearing down, less handling and less breakage.

The next step in advance of this style of kiln was the building of two permanent walls, in which the fire holes were placed, while the ends were left open. Such a kiln could be filled to any desired size, and the two ends scoved up as usual. This style of kiln is becoming very popular, and saves the building and tearing down of two walls at least, each time a kiln is burned.

Still another step in advance was the building of four permanent walls, leaving only doors for charging and discharging the kiln. The fire arches are also permanent, and run from side to side beneath the kiln proper. The heat rises up through the floor and through the unburned brick.

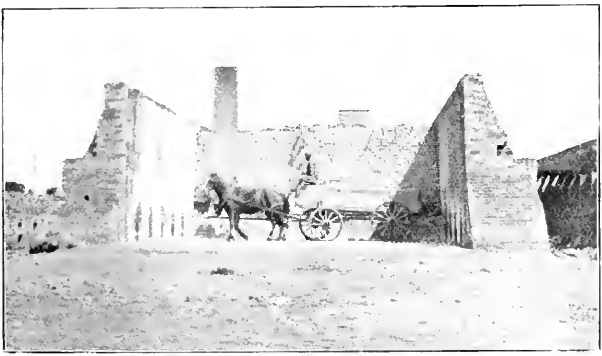

Fig. 35.—Permanent walled up-draft kiln, capacity 250,000 brick : London Builders' Supply Co., London.

These are all examples of up-draft kilns, that is, the heat enters the bottom, rises through the brick and escapes from the top.

The next great step and one which marks a big advance over the old method, was the introduction of down-draft kilns. These are becoming very popular throughout the Province. They may be round or rectangular in shape, but the principle underlying them is the same. They are necessarily permanent kilns. The fire holes are placed outside the kiln and extend just through the wall. The heat then rises through a pocket, which may be built of unburned or of burned brick, to the top of the kiln, striking the dome. It then passes down through the unburned brick, and out through the floor which is left open, beneath which a series of flues connect with the chimneys. Thus we see the course of the heat here is exactly reversed, and the great advantage of this style of kiln is, that by the use of dampers, the heat can be thrown to any part of the kiln, so that the whole of it can be burned alike. Moreover by dampering, the fires can be so regulated that the brick are not fused, as was often the case in the other style of kiln, nor is there much waste heat. In kilns of this kind, the burning can be so regulated that over ninety per cent. of the output will be good, hard face-brick. Again, where two or three of these kilns are placed in a series, the waste heat from one in the cooling stages, can be drawn through another, to warm it up, preparatory to burning.

So much then may be said for the types of kiln commonly used throughout Ontario. There is one other system, however, in use in two places. It is known as the continuous kiln. A series of chambers are arranged side by side, in a large circle or

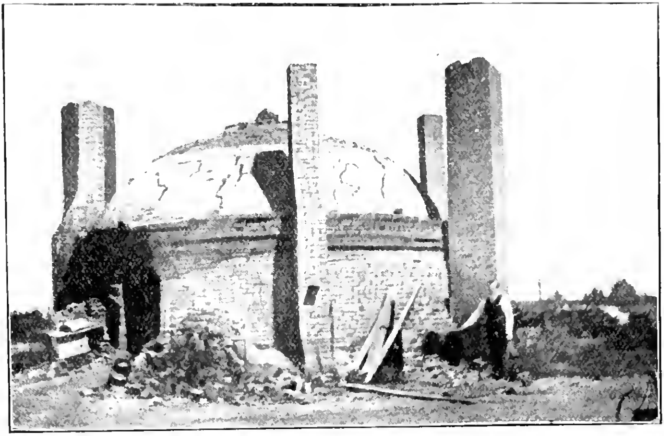

Fig. 36.—Round down-draft kiln, five arches, with chimneys outside; capacity 60,000 brick.

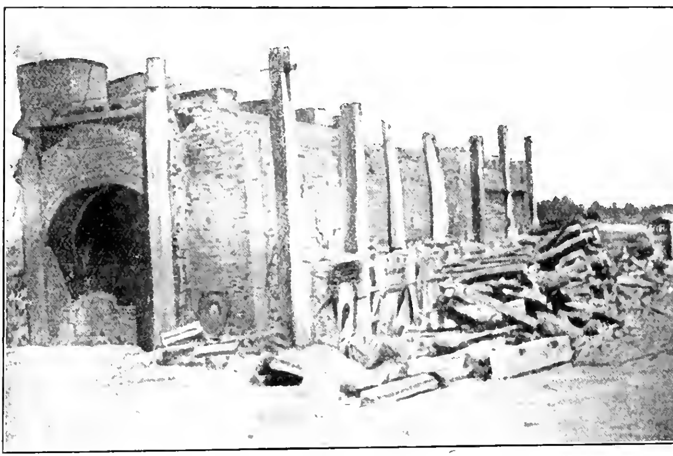

Fig. 37.—A rectangular down-draft kiln, capacity about 120,000 brick.

sometimes in an oval. Two or three of these are filled and the fire is started under say No. 1. By a system of dampering, the waste heat from No. 1 is drawn through No. 2 and 3. In the meantime No. 4, 5, etc., are being charged. By the time No. 1

is burned, the fire has been gradually coaxed into No. 2, and so on, the process is repeated throughout the circle, so that once the fires are lighted, they are never let out, but are drawn round and round the kiln, from chamber to chamber, some chambers being burned while others are being charged, and still others are being discharged. This is known as a continuous kiln, and its advantages are apparent.

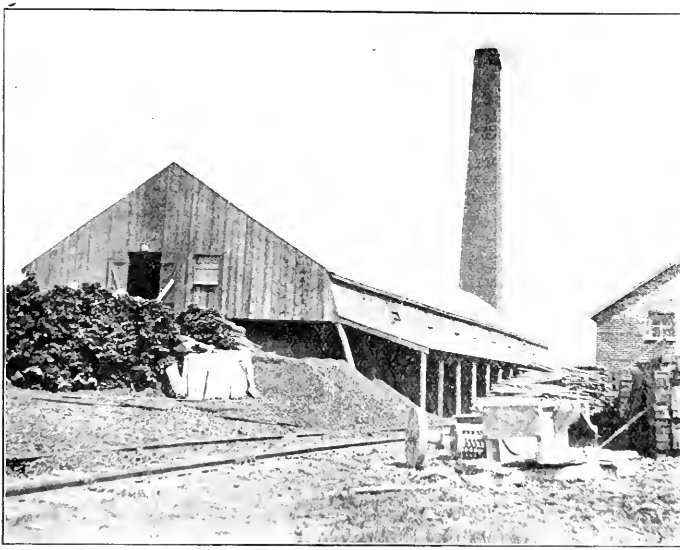

Fig. 38.—16-chambered continuous down-draft kiln, capacity 340,000 brick: Port Credit Brick Co.

The Question of Fuel

The first step in the burning of every kiln, is the removal of a certain amount of moisture, which remains after any one of the systems of drying mentioned above. This process is known as steaming, or water-smoking. This should always be done slowly, as too rapid heating will burst the brick, either by the escaping steam or by forming a crust or shell around the brick which prevents the moisture from the centre escaping. The water-smoking should be done with wood as a fuel, or coke, for if coal be used the soot will lodge in the spaces between the brick and choke the kiln. After the water-smoke is off, any fuel may be used for the burning, but dry fuel should always be used as far as possible.

A great deal has been said on this subject and the question is commonly asked, "Which do you find cheaper to burn, wood or coal?" The answer to this depends entirely on the kind of wood or coal burned. Unfortunately, the majority of brick-makers get the poorest class of wood to be had in the neighborhood. This is a great mistake. The brick-maker should get as good wood as possible, and particularly dry wood, that is wood that has been cut for at least a year. Each 10 per cent. of moisture

in wood detracts 12 per cent. from its heating value, and since wood which has been cut even for a year, contains 25 per cent. of water, 30 per cent. of the heating value is used in driving off this moisture, before any of the heat is available to burn the brick. This being the loss with dry wood, how much greater is the loss when wet, punky wood is used?

Another point not generally known, is that one kind of dry wood has the same heating value as another, when considered weight for weight; that is one pound of dry pine has the same heating value as one pound of dry hickory or maple. To compare these with coal, it is found that taking air-dried wood:

1 cord of hickory or maple, weighs	4,500 lbs.	1,800 lbs. soft coal.
1 cord white oak, weighs	3,850 lbs.	1,340 lbs. soft coal.
1 cord beech or red oak, weighs	3,250 lbs.	1,300 lbs. soft coal.
1 cord elm, weighs	2,350 lbs.	940 lbs. soft coal.
1 cord pine, weighs	2,000 lbs.	800 lbs. soft coal.

From the above it will be seen that one pound of soft coal is equal to about two and a half pounds of any kind of dry wood, and that pound for pound, one kind of wood is as good as another, if dry. Again, one cord of maple is as good as two and one-half cords of pine, and one cord of pine is about as good as a cord of elm. Other comparisons are obvious. It would appear, however, since a cord of dry maple is not equal to one ton of soft coal, which rarely costs over three dollars and a half, that coal is the cheaper fuel to use. Moreover, coal takes less handling and less yard-room.

The burning of clay in the manufacture of brick, is probably the most important part of the industry, for the best of clay can be spoiled by poor burning. Two classes of brick are made in Ontario, red brick, and buff brick, commonly spoken of as white brick. The red color of the brick is caused by the iron in the ferric state. Strange to say, the clay from which red brick are made and the clay from which white or buff brick are made, have in Ontario, practically the same percentage of iron, but the difference in the result of burning is caused by the high percentage of lime in the clay used for white brick. This lime prevents the iron burning to the ferric state, and thereby prevents the brick from burning to a red color.

The word ferrous comes from the Latin root "ferrum," meaning iron. Iron has the power of forming two classes of compounds; for example, it can combine with oxygen in the ratio of 1 to 1, forming the compound FeO, known as ferrous oxide. Or again, it can combine with oxygen in the ratio of 1 to 1½, but as we have no half quantities in chemistry, this formula must be doubled, thereby being written Fe_2O_3; this is known as ferric oxide. Thus the "ic" compounds are the more highly oxidized. Hence the statement above that the red color of clay products is due to some compound of iron in the ferric state. These two conditions are brought about by the character of the atmosphere of the kiln in which the goods are burned, *e. g.* if a kiln be burned with the drafts well opened, so that plenty of air is admitted, we will have an oxidizing atmosphere within the kiln, and this will tend to produce ferric compounds, which as we see would be red. On the other hand if a kiln be burned in which the drafts are not kept freely open, a scant supply of oxygen is admited, and this is not more than is required by the burning fuel. The result will therefore be that the kiln will be filled with reducing gases, and this will produce buff-colored goods. Therefore in burning red brick, tile, or other products, a liberal amount of air is required, while in burning white brick, tile, etc., too much air should not be admitted.

Flashing

One other point in connection with burning, which requires special attention, is flashing. Many bricks used for the fronts of large buildings, especially where pressed brick are used, are purposely flashed. This consists in darkening the edges, while the

centres of the faces are left the proper color. This darkening is caused by a special treatment in firing, that is by so placing the brick that tho edges to be flashed are exposed to reducing conditions at some stage in the burning. In this way the iron is reduced to the ferrous state, and at a later stage they are suddenly exposed to an oxidizing action, which darkens the edges to a rich reddish-brown, or even a greenish tint. The oxidation usually takes place in the cooling stages of the burning. If all the brick are desired a light grey color, the cooling should be done with all the air entrances closed.

The flashing, to which special reference should be made, is not that referred to above. The trouble, as most of the brick-makers in Ontario know, consists of red flashes or streaks on white brick and tile, and is due to some of the iron in the clay having been oxidized to the ferric state. The Erie blue clay mentioned above as occurring over the greater part of Ontario, has roughly 5 per cent. of iron. If this could all be burned to the ferric state, the brick would be red, but the presence of so much lime in the clay prevents this. Where the percentage of lime is three times or over the percentage of iron, it will prevent the iron being burned to the ferric state. Instead of that we have ferrous carbonate, and this gives the buff color to the goods. If anything should happen to cause the oxidation of a little of the iron to the ferric state, a red streak or flash would be produced. In following a kiln of white brick, we see that first the water-smoke is driven off by a slow fire, then the kiln is heated up; between fires when the kiln is going well, the doors are closed and in many cases they are even mudded over. The consequence is a scarcity of oxygen, and a reducing atmosphere within the kiln. This as we have seen forms ferrous oxides, carbonates and silicates. This is quite correct, and should be the condition for white goods. The flashes, however, occur in the cooling stages. After the kiln has been burned, as we have seen above, it is closed up, and allowed to cool for a couple of days, *i. e.* the drafts are all closed up. But as the kiln cools it naturally contracts, *i. e.* the bricks in cooling contract as well as the air within the kiln. The result is, they tend to occupy less space within the kiln. Cold air must therefore get in to fill the unoccupied space. It cannot enter through the doors, since they are closed and mudded up, it therefore comes down through the chimneys, and through the flues, rising through the floor it meets hot brick, whose compounds we have seen, are in the ferrous state This fresh air at once oxidizes some of the ferrous compounds, especially the oxides to the ferric condition, and a red flash is produced. This of course all applies to those burning in down draft kilns, and it is in these that the difficulty is met. We thus see that to prevent flashing white goods, we must prevent oxidizing drafts coming in contact with tho hot brick. Probably the best way to overcome this difficulty is to keep one or two fires burning lowly during the first day or so of the cooling, thereby allowing the kiln to cool off gradually, and at the same time enabling a reducing atmosphere to be preserved till the brick have cooled to a point where the admission of air can no longer oxidize them. For burning red goods just the reverse is required, that is, a plentiful supply of air must be admitted throughout the whole of the burning and cooling.

For burning brick with coal, it is always best to water-smoke with wood, and even to heat up from four to six hours with wood before going on to coal.

One other point should be mentioned in connection with the cooling of the kiln. This should never be hurried, for if brick are cooled too quickly the outside of the brick cools too quickly for the interior, and the result is that the kiln is "shaken," or in other words, the brick will be all cracked.

In burning brick in open-shed scoved kilns, great difficulty is experienced in distributing the heat evenly throughout the kiln. A great many devices have been tried to overcome this difficulty. In the old country the raw clay has been mixed with sawdust, ground charcoal, or powdered coal, so that in burning, these combustible products would help distribute the heat. In Ontario, powdered coal has been used in this way

for the bricks placed in the heads of the kiln, the user claiming good results from the practice. There is never any difficulty in getting sufficient heat up through the centre ot the kiln, but it is difficult to get sufficient heat to pass up through the heads to burn them to hard brick. This is accomplished to some extent by leaving the spacing wider in the heads than in the central part of the kiln in piling the brick, but this is not altogether satisfactory. A very ingenious method and one employed to some extent in Ontario, is to place a small ridge of hard coal screenings around the edge of the kiln on top of the platting. After the fires have been started, and the heat has worked pretty well up to the top, the kiln man goes up with a small wedge-like poker, and works the bricks slightly so as to allow a little of the screenings to trickle down through the heads. These take fire, and by their heat not only help to burn the brick, but induce a little additional draft up through the heads, drawing more of the kiln-fire to those parts of the kiln. This operation is repeated every hour, only a little of the coal screenings being allowed to trickle down each time. This must be carefully watched so as not to allow too much to enter, so as not to block or choke the drafts through the heads. In the kilns where this is used, excellent hard face brick were taken from against the scoving, and the process seems to largely prevent the occurrence of soft brick in the heads. The coal is piled about eight inches deep, and sixteen inches wide, at the base, tapering down from the crown to the base.

PART III.—THE CLAY INDUSTRY IN ONTARIO

Having now dealt in a general way with the subject of clays and their occurrence in Ontario, let us take up the industry in more detail.

To do this we will discuss it county by county. It was found impossible to call at all the brick and tile yards and all the potteries in each county, but as many as possible were visited, and suggestions were made and samples were collected at many of these.

A detailed description of the plants found at the various yards is given in order that those directly interested in clays may see points in which their plant, or processes of manufacture are perhaps capable of improvement. The clays will each be referred to its proper class as described in the former part of this report, viz.: Red-top clay, Erie clay, Saugeen clay, etc.

Addington

J. Sauls, Tamworth: This yard is situated in a hollow about two hundred yards from Tamworth station. There is about three feet of Red-top clay lying on Erie clay, and this is dug by hand and carted to a tempering heap close to the machine; here it is mixed with sand, and wheeled in barrows to a Martin machine run by horse power.

The brick are "hacked" out to dry and are burned in up-draft scoved kilns with wood as fuel. Red brick only are made here.

Algoma

W. A. Evans, Sudbury: This yard is situated about two miles west of Sudbury on the Copper Cliff road. A very excellent clay is found here. In some places it is rather sandy, especially on top; but these spots are quite local, and the clay as a whole is excellent. The Saugeen clay is dug directly from the bank and hauled by car and cable to two Iron Quaker machines. These are run by steam power, the hoisting also being done by steam. The brick are hacked out in the usual way to dry in open yards, and are then burned with wood in open-shed scoved kilns, also one case kiln. The output of this yard is about three million per season; all red brick.

A new use for this clay has recently been found by the Canadian Copper Company

at Copper Cliff. In lining their converters, fire clay was always used, but running short of fire clay they got some of this clay from the brick-yard, and on trying it found it to give very good satisfaction. The result has been that they have been using it since, and it is claimed to work quite satisfactorily, although, of course, not the equal of fire-clay, but when it can be dug within two miles of the works, at comparatively little cost, it is considered to be no small advantage. The analysis of this clay is given as No. 68, page 26 of this report.

M. McVittie, Whitefish : This is a small yard situated at Whitefish on the Sault branch of the C. P. R. There is the usual section of Saugeen interbanded clay, which is dug in the fall, put in a heap and allowed to slake. It is then wheeled to a Martin machine run by steam power. The brick are hacked out in the ordinary way to dry, and are then burned with wood in open-shed scoved kilns. A good quality of red brick is made, and the output is about 700 thousand per season.

The Algoma Commercial Company, Sault Ste. Marie: As we work westward from North Bay we find the clay becoming much stronger, the bands thicker, and very much redder in color, so much so that by the time we reach the Soo the clay is quite red in color, resembling very much the Medina shales worked at Milton, Hamilton, etc. At the above mentioned yards a very high bank of red Saugeen clay is found. This bank was exposed in making a cutting for the Algoma Central railway, and was acquired by the Algoma Commercial Company for the manufacture of the brick required for their many beautiful buildings at the Soo. They, however, installed a dry-press plant, which has not worked altogether successfully. The trouble appears to be that the clay was not ground fine enough, nor was the burning quite hard enough, as all the softer brick upon exposure to the weather, especially to moisture, have been found to crumble readily.

The clay was dug from the face of a bank in places twenty feet deep. It was hauled by car to a long shed, the floor of which was composed of steam-heated coils. The clay was dumped on this to dry, after which it was taken in cars and dumped to a hopper from which an elevator took it to storage bins. These in turn fed a pan-mill, where the clay was ground; but the grinding does not appear to have been fine enough. This is the difficulty which all makers using clay instead of shale are experiencing as yet in Ontario. The clay must be ground to a very fine powder. The ground clay was then fed to a Simpson dry press, and the brick wheeled directly to a series of six rectangular down-draft kilns. The water smoking was done with wood or coke and the final burning with soft coal. Those brick which were composed of fine enough material and which were burned sufficiently hard are a very superior brick, and there is little doubt that with these two points improved an excellent product would result from this clay, as the color, etc., was excellent. This plant is not working at present. The analysis of this Saugeen clay is given above, No. 69, page 26 of this report.

Charles Lethbridge, Sault Ste. Marie : This is a small yard situated about three-quarters of a mile northwest of the last mentioned yard, where there is the usual section of Saugeen clay, here very red in color. This is dug and carted to a pug-mill feeding a new Quaker machine. The bricks are dumped on pallets and dried by the rack and pallet system, after which they are burned with wood in open-shed scoved kilns. The output is about 500 thousand per season, all stock brick. Pressed brick is made from the same clay by the Algoma Commercial Company. Here we have stock brick made from it by the soft-mud process, and in the yard to be described next we will have wire-cut brick made from the same clay by the stiff-mud process.

Elliot & Sons, Sault Ste. Marie : This is one of the most interesting yards in the Province. Mr. Elliott, who was a brick-maker in England, came with his family to Canada, and he and his several brothers have had brick-yards in various parts of the Province; for example, at Wingham, at Thedford, Glenannan, Bluevale and the Sault. At the last named place it was found difficult to get a machine, so Mr. Elliott

built a little furnace, bought scrap-iron, and after melting his iron, made his own machines completely from his own patterns and ideas. Everything in his yard in the way of equipment has been designed and manufactured on the place, and a better equipment would be difficult to find in the Province. He manufactures wire-cut side-cut brick, also tile and block, all of excellent quality. His clay is dug and hauled by cars with a horse to the machine of his own make, which resembles very closely a Kells machine. The brick are then piled on pallets and dried in a rack and pallet yard, and are then burned in open-shed scoved kilns and also in one rectangular down-draft kiln of Mr. Elliott's own design. This is not a large yard, making only about 800 thousand brick, with some tile, etc., but the originality displayed by Mr. Elliot in every part of his yard is a great credit to him.

Brant

Wm. Blacker, Brantford, makes white brick only; this is an old yard. The clay is got from the face of a large hill, which is composed of a very sandy blue clay. It is blasted out in winter and allowed to slake until spring, when it is carted to a

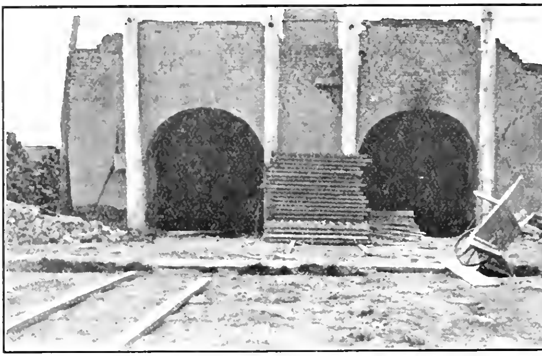

Fig. 39.—Double rectangular down-draft kiln, one set of chimneys for both kilns; F. Entricken's yard, Stratford.

Martin brick machine which turns out a first-class stock brick. The brick are dried in a rack and pallet yard, and are burned in a double long walled rectangular down-draft kiln. There are two kilns placed side by side with a row of chimneys between the two, which serve for both kilns. The fire holes, ten in number, are all located in the outer wall of each kiln.

Brantford Brick Company, Limited, Brantford: Manufacture red stock brick from a very sandy red clay which has been collected locally and varies in depth from three to twelve feet. It is underlaid by the Erie blue clay, but this is not used. The clay is dug in the fall or early spring, and is piled in heaps interlayered with proper proportions of sand. The whole section is then cut down and wheeled to a Martin machine. The Bechtel Carless dryer is used to dry the output of 12,000 per day, and the dry brick are burned in ordinary scoved kilns, and are of very fine quality.

Sam Allen runs a red brick yard at Brantford, and uses a similar red clay to that at the Brantford Brick Co.'s yard. He hauls his clay by cart from about three-quarters of a mile, and heaps it with sand in proper proportions to temper. It is then

put through a Baird pug-mill and a Quaker soft-mud machine. The brick are dumped on small pallets and are hacked out in open hacks to dry. The burning is done with wood in scoved kilns, and the output is about 8,000 per day.

These are the only red brick yards in Brantford, but there are two white brick yards.

J. Workman, Brantford, makes white brick. His clay, like that in Mr. Blacker's yard, is a very sandy blue Erie clay, which is picked out and loaded into Baird automatic dump-cars; these are hauled by cable to a Martin machine and a good stock brick results. Drying is by the rack and pallet system, and the brick are burned by wood in open shed kilns.

N. B. Card, Harrisburg, has from one to three feet of good Red-top clay which is burned to red brick. Beneath this is the grayish blue Erie clay, which burns to white brick and tile. He uses horse power and a Martin machine, and makes about one-half a million brick per year. The deposit is a good one and is worthy of much more extensive use.

Bruce

Reid Bros., Hepworth, manufacture white end-cut wire-cut brick from a very stiff blue Erie blue clay. This is hauled by cart to a pair of rolls feeding a Kells No. 2 machine; the Bechtel automatic cut-off is used and Bechtel trucks to open hacks. The burning is done by wood in four round down-draft kilns. The clay here is a very fat, stiff clay, with little or no sand, but burns to a good close brick or tile. This yard manufactures about a million brick per year.

Fig. 40.—Bell Bros' yard, Paisley.

Bell Bros., Paisley, have from a foot to a foot and a half of the Red-top clay, lying on a brownish red clay, and this in turn on the blue Erie clay. This reddish brown laminated clay corresponds with the yellowish brown clay of southwestern Ontario lying between the Red-top clay and the blue Erie clay proper. Bell Bros. use the first eight feet of reddish brown and Red-top clay, digging it together, and cart to a Kells machine, making first-class white brick and tile. The brick are then cut, and wheeled on Bechtel trucks to open hacks. The brick are burned in open shed kilns and the tile in round down-draft kilns, the fuel in each case being wood.

The Erie clay here is very deep, the Saugeen river flowing between high banks of blue Erie clay.

William Adamson, Walkerton, manufactures only red tile and hollow block, using an English plunger machine. He burns in a square down-draft kiln, with a mixed fuel of wood and coal. The clay here is the typical Saugeen clay described above. The thin bands of reddish brown clay and grayish sand alternate from top to bottom of the bank, making a very odd but interesting section. The bands are not over half an inch in thickness, and give a perfect mixture when the cliff is dug from top to bottom. The individual bands of clay would be much too strong to work by themselves, even could they be obtained, so that the alternating bands of sand are the salvation of the deposit. The bank itself is eight feet thick and rests on a bed of white quartz sand, the upper two inches of which have become cemented into a flag of sandstone by the calcareous material derived from the overlying clay; beneath this the sand is quite soft and granular. The clay is dug and wheeled to a pug-mill which mixes it thoroughly; it then drops to a cotton belt carrier which feeds the plunger machine. The tile produced are very smooth and free from cracks, and are claimed to stand the frost and burden admirably.

L. Yaack, Walkerton: This yard is situated about one mile northeast of Adamson's yard, but strange to say contains quite a different clay. It is situated on the opposite bank of the Saugeen river at about forty feet higher altitude. The clay here is the usual Erie blue clay with the yellowish brown top, from which white brick only are made. The clay is ploughed in the fall and scraped into heaps, where it is allowed to freeze during winter. It is then wheeled to a Close machine making side-cut wire-cut brick. The clay is practically free from stones, and works up well after freezing. The brick are piled six on a pallet and are dried by the rack and pallet system. They are burned in one round down-draft Cornell kiln, and in one square down-draft kiln with permanent side walls and open ends which are scoved up as usual.

Carleton

Morris & Ballentine, Billings Bridge, have a great depth of red burning clay. The first five feet is quite strong; this is followed by about seven feet of milder yellowish brown sandy clay; below this is the typical blue Leda clay which corresponds to the Erie clay in the west. It has the same blue color, is equally tough and strong, and at Ottawa is ninety-four feet deep; burns to red goods, but differs in having the marine shells as described in the preliminary part of this report. The red, the yellowish, and sufficient of the underlying blue clay are all dug together and loaded to automatic dump-cars which are dumped into a Baird pug-mill. This feeds a pair of rolls, which crush any small stone present, and the product is fed to two machines, one being a Martin, and the other a Standard, manufactured in Ohio. The brick are then piled, one hundred to a car, which is run to the rack yard where the pallets are piled off as usual. The dried brick are again piled on the cars for "wheeling in." The burning is done in open shed kilns, scoved as usual, the fuel used being wood. This company manufactures over two million brick per season.

H. Mulligan, Harvard, Ottawa, has a deep bank of the Leda clay on the shores of the Rideau canal. The clay is dug in the winter time to about water level, and is piled in heaps to freeze; it is then hauled in cars which dump to a pug-mill, which in turn feeds a pair of rolls, and Hercules six-brick machine. This is a good type of soft-mud machine; it is built entirely of steel, and is open to view all the time, so that any change of temper can be readily effected. The bricks are dried by the rack and pallet system, and are burned with wood in open-shed kilns, and in one round down-draft Cornell kiln. Only red brick are made and the output is about one million and a quarter per season.

The Ottawa Brick Manufacturing Co., Harvard, Ottawa: This company operate a large yard and manufacture about two and one-half million brick per year. They have the same clay as Mr. Mulligan, and the description of it will apply to

all the Ottawa yards. The clay is dug in winter, and heaped to slake; it is then wheeled in barrows and dumped into three pairs of rolls, which in turn feed two pug-mills and one belt conveyor; these feed three Martin machines, the brick are dried by the rack and pallet system.

The burning is done in one large twenty-four arch, permanent walled up-draft kiln, capable of holding four hundred thousand brick. In addition to this, open shed scoved kilns are used, the fuel in both cases being wood. Three independent gangs operate in this yard, giving an output of four million red brick of first-rate quality per season.

Odell Brothers, Ottawa: The same clay is found here as in the other Ottawa yards, so that a description of it is not necessary. The clay is dug in the winter as usual and allowed to slake; it is then wheeled to a Quaker, and a Martin machine, the brick are dried by the rack and pallet system, and are burned with wood in scoved kilns without sheds. In case of rain the kiln is covered with loose boards. The operator claims that the time saved in loading and unloading the kiln, together with the advantage of building his kiln at any point on his yard more than makes up for the extra handling of lumber and loss in case of storms. For his yard he would require a much larger shed than he cares to build. He manufactures about two million brick per year.

Cain Brick Company, Ottawa, has the clay described above, which is dug in winter and mixed with the proper proportion of sand for tempering, and allowed to stand until spring. It is then wheeled to two Martin machines, making a good stock brick. The brick are dried by the rack and pallet system, and are burned with wood in open shed kilns. The output is about two million and a half per year, and the brick are of excellent quality.

T. O'Reilly, Harvard, Ottawa, has the usual section of Ottawa clay, that is, a Red-top clay, quite strong, which overlies roughly five feet of a milder sandy clay, which in turn overlies a great depth of stronger Leda blue clay. The Red-top clay, with the mild clay and three to five feet of the blue clay, is dug in winter and heaped to temper until spring. It is then wheeled to a pair of rolls which feed a pug-mill that in turn feeds a Martin machine. The bricks are dried by the rack and pallet system and are burned with wood in open shed scoved kilns. The output is about one million red brick per year.

Dufferin

Thomas Cook, Orangeville, manufactures only red stock brick, using a Martin machine and horse-power. He works about three feet of strong Red-top clay, which is taken directly from the bank to the machine. The brick are "hacked" out to dry, and are burned with wood in open shed scoved kilns. The output is only about three hundred thousand per year.

Durham

R. H. Hambly, Bowmanville, has three feet of strong Red-top clay underlaid by blue Erie clay which is also very strong and free from stones. Both these clays are worked, the Red-top clay being made entirely into brick with a Martin machine and horse-power. The brick are dried by the rack and pallet system, and are burned with wood in open shed scoved kilns. The output is about five hundred thousand red brick per season. The blue Erie clay is also dug and made into tile by a Kells machine. The tile are of an excellent quality and are creamy white in color. A few hollow blocks are also made from the blue clay by the Kells machine. These are very strong, and are becoming quite popular in building foundations for barns or other frame buildings. The output of tile from two and one-half to five inches in diameter is about sixty thousand per year

Crowhurst Bros., Port Hope: This is a small yard, manufacturing only seven hundred thousand red brick per year, but they are of the very finest quality, and the yard is one of the best in the Province. There are from two and one-half to five feet of Red-top clay practically free from stones, but immediately below this is the Erie blue clay, and strange to say, this is quite stony. The Red-top clay only is used, and is manufactured by a Martin machine with horse power into stock brick. The brick are hacked out in the usual way to dry; they are then burned with wood in open shed scoved kilns, and it is in this respect that this yard excels all others seen in the Province; the burning is so carefully done that even the arch brick are in excellent shape, and are sold readily for face brick. These kilns are a good example of what can be done by the brickmakers themselves, if they would study their burning more carefully. Probably one secret of this firm's success is that the arches are built much higher in the crown than those seen in most yards.

Elgin

William Light, Aylmer, has an excellent deposit of Red-top clay in some placea locally collected to twelve feet in depth. This is manufactured into red brick, tile, and hollow block, especially the latter. The burning is done in open shed scoved kilns with wood for fuel. About four hundred thousand brick per year, and one hundred thousand tile and hollow block constitute the output from this yard. These are purely for local consumption.

E. C. Becket, Orwell; F. Davenport, Orwell: These two yards lie side by side with a fence between and as the clay is the same in both, as well as the method of manufacture, a single description will apply to both. The chief output is tile and hollow block, with just sufficient wire-cut brick for the pockets in the kilns. All the goods are creamy white in color and of excellent quality, smooth, hard, and free from cracks. The Erie blue clay here is overlaid by only a foot of Red-top clay, and this is shovelled off and kept to re-cover the blue clay with a soil which will preserve the farm. The blue clay only is used. The burning is done in round down-draft Cornell kilns, the pockets are built each time of green wire-cut brick arranged in a semi-circle with their ends to the fire. The remainder of the kiln is filled with tile or hollow block. All sizes of tile are made, from two and one-half to twelve inches in diameter, and in filling the kiln these are so "nested" as to give large capacity. The brick, tile and hollow block are all made by the Kells machine. The water-smoking is done with wood, after which the kiln is fired up from four to six hours with wood. This is to drive off the last traces of moisture before going on to coal, and prevents to some extent the red flashes so often seen on white brick and tile. Both these gentlemen by this method of burning, turn out goods of a beautiful cream white color. The grates used in these kilns are thirty-six inches long, fifteen inches wide, and twenty inches high, and give first-class satisfaction.

D. McGibbon, Shedden, manufactures white brick, tile and hollow block from the Erie blue clay. This is dug from a mound, on the top of which there is little or no Red-top clay, but as we approach the hollow about the mound the Red-top clay begins to thicken and in places reaches three feet in depth. The blue clay only is used. This is carted to a Tecumseh machine, an American machine of large capacity, having an automatic cut-off, very much like the Bechtel cut-off. The Bechtel trucking system is used for wheeling out, and the drying is done in sheds. The goods are burned in a down-draft Stuart kiln with wood for fuel. The floor, the pockets, and the fire holes are all built of fire brick, making a very expensive kiln, but the goods burned in it are of excellent quality. This is a very neat, tidy yard, having granolithic walks from the machine to the drying sheds, and from these to the kilns.

Ponsford and Freek, St. Thomas; The operators of this yard are building contractors and use for the most part pressed brick or stone for their outside work. They

manufacture their own brick for inside work, the result being that they pay little or no attention to the shape or color of the brick, so long as they are burned sufficiently for inside brick. They make only white brick by a Martin machine, dry by the rack and pallet system, and burn with wood in open-shed scoved kilns, their output being about one million brick per year.

Essex

D. Volkes, Comber, works two and one-half feet of Red-top clay which is dug and carted directly to a Kells machine with a pair of rolls to crush the small stones and lumps. Manufactures red wire-cut brick, tile and hollow block. The brick are wheeled out on Bechtel trucks to open air drying sheds, and the burning is done with wood in two round down-draft kilns. The output is about six hundred thousand red brick and about two hundred thousand tile and blocks. The quality of the goods is first class, and Mr. Volkes is aiming at making his yard much more efficient by studying and improving wherever possible.

H. Hallat, Comber : This yard is situated about half a mile west of Comber station, at what was formerly a charcoal plant, a series of bee-hive charcoal kilns being all that is left to mark the place of the former industry. Mr. Hallat attempted to use these kilns by putting in a series of fire arches and an open kiln bottom. Upon burning his first kiln, however, the charcoal in the floor, below his kiln bottom, burned out, allowing the kiln to settle unevenly, so that it choked in many places, and the burn was a failure. At the time of the writer's visit he was re-constructing the kilns, making them lower and otherwise attempting to avoid the former difficulty. His clay is the usual thickness—about three feet. This is hauled by automatic dump cars to a Baird pug-mill, which feeds a pair of rolls and a Kells machine. The Bechtel automatic end-cut cut-off machine is used here with good results. The brick are wheeled on Bechtel trucks to open air drying sheds. The fuel is wood for the water-smoking and heating up, and coal for the finishing. The yard has been in operation only two months when visited by the writer, and will no doubt prove a success with the improvements made by Mr. Hallat, as his brick plant is a good one, and is nicely arranged. The power used is a twenty-five h.p. gasoline engine.

Hill Brothers, Essex Centre : The clay bank here shows about two and a half feet of Red-top clay, underlaid by about two feet of more or less stony red clay, and beneath this about one hundred feet of typical blue Erie clay as shown by a well bored in the yard. The Red-top clay only is used. This is hauled in automatic dump cars to a hopper which feeds a Baird pug-mill, on which Mr. Hill has arranged a cone-pulley for three speeds, for brick, tile and hollow block. The Baird pug-mill feeds a pair of rolls on a Kells machine; the brick are cut off by an automatic end-cut machine of Mr. Hill's own manufacture. The bricks are dried in open hacks and are burned in two round down-draft kilns. A single large chimney placed between the kilns serves for both, and the heat usually lost in cooling off one kiln is used by Mr. Hill to help dry and warm up the green kiln. This is done by having a sheet iron plate on the top of his kiln, which is lifted off the green kiln, the drafts to the chimney are closed, and the heat is thereby drawn through the green kiln, escaping through its top. The kiln is then closed up and fired in the usual way. By this means a great deal of fuel is saved. Mr. Hill has a further simple, but very ingenious method of controlling his burning; by carefully watching he has found that when his brick have shrunk one-eighth they are sufficiently burned. To accomplish this without cracking or fusing the arches or pockets, he has found that his whole kiln should shrink one-quarter of an inch per hour; to regulate this he makes a small hole in the iron plate mentioned above and through this he stands an iron rod on end, the lower end resting on the brick inside the kiln; this rod is marked off into quarter inches. As the kiln shrinks this rod sinks through the hole and he can

hasten or slacken the fire as required. His water-smoking and first firing are done by wood, after which he finishes with soft coal. This yard turns out first rate red brick, tile and hollow block, and is a fine example of what can be done by each man studying the peculiar behavior of his own clay. The result to Hill Bros. is that over ninety per cent. of their output is first class face brick.

J. Wigle, Leamington, has two and one-half feet of Red-top clay underlaid as usual with the Erie blue clay. The Red-top clay only is used, and is made into red brick, tile and hollow block. About six hundred thousand brick and about three hundred thousand tile and hollow block are made per season. The clay is hauled in cars to a Baird pug-mill, which feeds a pair of rolls and a Kells machine for the tile and hollow block; and a Penfield U. S. side-cut wire-cut machine for brick. The tile and hollow block are dried in a hot air drier of Mr. Wigle's own design. He uses the exhaust steam through a series of iron pipes beneath an open slat floor. The tile and block are stood on end on this floor and dry much more quickly than they would in an open shed, and being away from winds they escape the cracking often caused thereby. His brick are dried in open hacks as usual, the tile and block are burned in down-draft kilns with green brick for the pockets, and the brick are burned in open shed scoved kilns.

William Curry, Sandwich, has about two and one-half feet of Red-top clay, which is used with Erie clay and iron-bearing sand, the whole burning to red brick. The clay is hauled by car to a six-mould plunger machine manufactured in Detroit. This machine has a large capacity and runs with very little power. The brick are dumped, six at a time, to a pallet, and thirty-two pallets are piled on a rack set on a car; thus each car holds 192 brick; these are run into the rack-yard, and the pallets are piled into the racks to dry. They are then re-loaded and run into the kiln yard. The burning is done with coal, coke being used for a water-smoking. The scoving is done with hollow block, which has several important advantages, for example, the scoving can be run up much more quickly than with brick; there is little or no waste in taking it down as the blocks are strong; and it can be used over and over. Mr. Curry claims that this method saves considerable fuel, the air space in the blocks preventing the escape of heat around the sides of the kiln. The output from this yard is about three million brick per year.

J. Robinet, Sandwich, has two feet of Red-top clay, underlaid by two feet of mixed red and blue Erie clay, followed by typical blue clay below. The whole section is dug about seven feet deep, and is mixed with some red sand, the whole burning to red brick. The clay is hauled about two hundred yards by mule and car which dumps to a hopper, feeding a plunger machine. The mould holding six brick are dumped on pallets, thirty-two of which are piled on a car, which is run to the rack yard and allowed to stand till dry. The cars are then run on to the kiln yard, so that the brick are not touched from the time they leave the machine till they are piled in the kiln, but this system requires over one hundred cars. The rails used throughout the yard are old gas pipe, which serves admirably, and have the advantage of being easily handled. The output is about eighteen thousand per day, and the clay for this is dug by two men and is all hauled by one mule, the men filling one car while another is being taken to the machine. The burning is done by coke and coal, as in Curry's yard, except that Mr. Robinet uses a grate four feet long in each end of his fire arches.

Frontenac

Mouldy Brothers, Kingston, have about two to four feet of Red-top clay lying on Erie blue clay. Both are more or less stony, the pebbles being for the most part limestone. These, in burning are converted into little pieces of lime, which when moistened expand and burst the bricks, so that it is necessary to remove the pebbles as far as possible by washing or crushing before the brick are made. The Red-top

clay only is used, but two methods of brick making are employed. Wire-cut brick are made with a Kells machine, using steam power, and stock brick are also made by hand. In this process the clay is mixed in an upright box by a series of blades which are turned by horse power; the mixed clay is then packed in single sanded moulds, scraped off on top and dumped one at a time on a small pallet, which is then hacked out in the ordinary way. Three men mould the brick in this yard, each one capable of turning out two thousand brick per day. This method differs from "slop" brick making, which is also a hand process, in that the moulds here are sanded, whereas in the slop brick method the moulds are washed each time they are dumped. This hand moulding makes a very fine brick, but the whole process, including the drying, is much too slow. The burning is done by wood, in one round down-draft Cornell kiln, and in open-shed scoved kilns.

Grenville

A. Clothier, Kemptville, has fully five feet of Red-top clay quite clean and free from stone. This is underlaid as usual by the Erie blue clay. The Red-top only is used, and is hauled by cars to a Baird pug-mill, which feeds a Quaker six-brick machine. The brick are hacked out in the ordinary way, but a change to the rack and pallet system is likely to be made. The goods turned out in this yard are of excellent quality, but the local market is easily supplied and the output is therefore small. The burning is done with wood in open-shed scoved kilns.

J. P. Wiser and Son, Prescott: This firm have an excellent bank of Red-top clay two to three feet in depth, used in the manufacture of red brick. Beneath this is a yellowish clay, a transition stage between the Red-top and the typical Erie clay below, which is used in the manufacture of tile and some light-colored inside brick. In the manufacture of brick, the clay is carted and dumped into a large circular "ring pit" capable of holding enough clay for a day's run. These are large circular vats from twenty to twenty-five feet in diameter and about three feet deep. They may be lined with boards, brick or concrete. Travelling around in a pit of this kind is an iron wheel about six feet in diameter, which at the same time moves back and forth along a shaft from the centre to the circumference of the pit, thus thoroughly mixing the clay. The clay is dumped into this pit, sufficient sand is then spread over it to give the correct temper, water is added and the whole thoroughly mixed in the manner described above. These machines take the place of the pug-mill, and are largely used in the United States, but this is the only one found in Ontario. Two of these pits are operated in this yard, each holding one day's supply, so that one can be mixing while the other is being discharged. The clay is wheeled from the pit to a six-brick machine made at Croton Landing, N. Y. This machine makes a first-class brick, but too small for the Ontario standard, being only 7 by 2¼ by 3¾ inches, instead of 8½ by 2¼ by 4. The brick are dried by the rack and pallet system and are burned with wood in open-shed scoved kilns. The firm has also a re-press machine, but finds no demand in Ontario for this class of bricks.

Grey

J. Lowe, Meaford: This yard, situated about three and one-half miles from Meaford, has about 3½ feet of Red-top clay underlaid by yellowish gray clay passing gradually into Erie blue clay below. The yellowish clay is used in addition to the Red-top clay by Mr. Lowe in the manufacture of red stock brick. The clay is carted to a pug-mill feeding a Martin machine. The brick are hacked out in the ordinary way to dry, and are burned with wood in open-shed scoved kilns.

J. M. Scott, Meaford: This clay is similar to that in Mr. Lowe's yard, but in addition to the Red-top clay which he uses in the manufacture of red stock brick, Mr. Scott also uses the underlying Erie clay for the manufacture of white brick. Both these kinds are manufactured with a Martin machine using horse power, and are burned with wood in open-shed scoved kilns.

W. H. White, Owen Sound, has three feet of Red-top clay overlying yellowish gray clay, which in turn overlies the Erie blue clay. The Red-top clay only is used in the manufacture of red brick. The clay here is somewhat sandy, showing a mixed character. It also contains stones of many sizes from pebbles to boulders a foot or more in diameter. All three clays fill an old gorge of pre-glacial age which cuts the Medina and Clinton formations. The clays in the gorge have the same relation to each other as those on the general land surface outside the gorge, but there seems to be more local interruptions, causing the clay to be more or less mixed with sand. The Red-top clay in the gorge is hauled by car to a Baird pug-mill which feeds a Martin machine; the brick are dried by the rack and pallet system and are then hauled by horses on small trucks holding from two to three hundred brick, to open-shed scoved kilns. The loaded truck is left at the kiln while an empty truck is being re-loaded. The burning is done by wood and the output for the season is about two million brick.

Robert Wyllie, Owen Sound: This yard is situated in the same gorge as that of Mr. White, but the clay here is very sandy. About five feet of it is dug and used in the manufacture of red stock brick. The clay is carted to a Baird pug-mill, feeding a Monarch machine, which makes six bricks at a time. The bricks are dumped on pallets and are dried by the rack and pallet system. The burning is done with wood in open-shed scoved kilns. The clay here has become so sandy as to be practically unfit for brick-making, and the yard is being abandoned, but Mr. Wyllie will locate near Mr. White's yard and will continue operations there.

J. Boone, Thornbury; John Buell, Thornbury: These two gentlemen operate side by side, the former using the Red-top clay in the manufacture of red brick, the latter using the Erie blue under clay in the manufacture of white tile. The brick are made with a horse-power machine making four brick at a time; these are hacked out in the ordinary way to dry, and are burned with wood in a permanent walled up-draft kiln, the ends being scoved. Mr. Boone improves his burn by mudding over a piece in the centre on top of the platting, thereby driving the heat to the walls of the kiln, and burning the heads much harder than they would otherwise be. This mudding is done when the centre of the kiln is seen to be sufficiently burned, and thus only uses the last of the heat of the kiln to improve the outside. Mr. Buell's tile machine is a small hand one, and while making a good tile has but a very limited capacity. His burning is done by wood in a small round down-draft kiln.

Haldimand

McDonald and Company, Canfield, have about two and one-half feet of Red-top clay underlaid by the usual Erie blue clay. The Red-top clay is made into red brick in a horse-power machine, only a few being made each season. They are dried by the hack system. The tile are made from the blue Erie clay, in a Kells machine, using steam power. The brick and tile are both burned by wood in two round down-draft kilns.

Halton

Toronto Pressed Brick Works, Milton: This yard is operated by Mr. C. J. Lewis, and is situated on the C. P. R. about one mile and a half northeast of Milton. All classes of building material made of clay are turned out by this company, including red pressed brick, buff pressed brick, and all varieties of fancy building brick for cornices, mouldings, corners and decorative purposes, also all varieties of red or buff terra-cotta. This is the only large terra-cotta works in Canada. This part of the plant is in charge of Mr. J. Lewis, a brother of the manager, and the excellence of the products testify to Mr. Lewis' ability in this line of work. This company also produces all kinds of roofing tile and cornice decorations.

The raw material used in the manufacture of all these goods is the Medina shale, so common to this section of the country, and which is seen in many parts coloring

the soil quite red The shale bank here is about fifty feet high, and about thirty feet from the surface is a band of bluish gray shale about two feet thick, which is used in the manufacture of the buff colored goods. The shale is drilled with steam drills and is blasted with dynamite. It is then hauled in carts to two pan mills, which are used

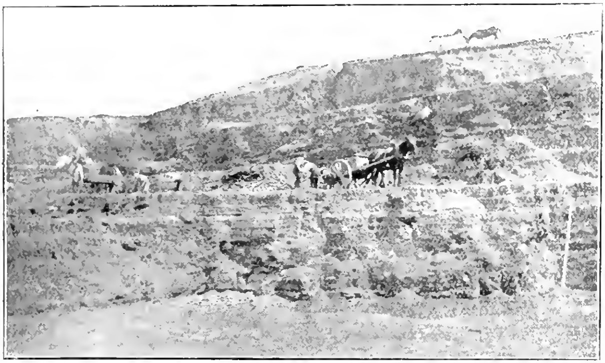

Fig. 41.—Medina shale bed worked for pressed brick and terra cotta by the Toronto Pressed Brick Co., Milton. Note light colored band half way up, which burns to buff brick: the remainder burns a rich, red color.

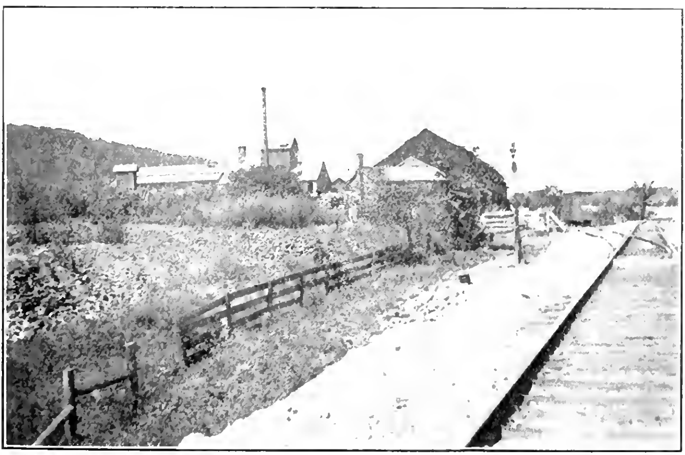

Fig. 42.—General view of The Toronto Pressed Brick Company's plant at Milton, Ont.

to grind the shale to a very fine powder, which is then elevated by belt carriers and dropped on an inclined screen. The "over-size" is returned to the pan-mills to be re-ground, that which passes through the screen drops to hoppers which feed four presses, two of which are built by the Goldie and McCulloch Company of Galt, the

other two by the Waterous Engine Company of Brantford. These machines receive the finely powdered shale and it is pressed in moulds in this dry form, each brick receiving a pressure of about eighty tons. They are lifted from this machine and wheeled directly to up-draft kilns.

This company has five of these kilns, each capable of holding from 146,000 to 190,000 brick. The kilns have permanent walls and fire arches, and are built in series, the raw brick being brought in on one side, and the burned brick taken out on the other and loaded directly into cars. The little water-smoking necessary is done with wood until the goods are perfectly dry, the remainder of the burning being done with coal. The output is about eight million per year.

In the terra-cotta department, the ground shale is pugged thoroughly and is then worked soft by hand, casts of plaster of Paris are then made from drawings of the required pieces of terra-cotta. From these casts, moulds are made of the pugged clay, these are further finished by hand and are set to dry. When thoroughly dried they are burned in a separate down-draft kiln, the firing being done first by wood, until all water-smoke is off, and then by coal till test pieces show the work to be completed.

Milton Pressed Brick Company, Milton: This plant, which is managed by Mr. J. S. McCannell, is situated about half a mile nearer Milton than the above mentioned yard. Red and buff pressed brick, and all varieties of decorative brick, are manufactured, including inside decorative brick for mantels, fire-places, columns, sills,

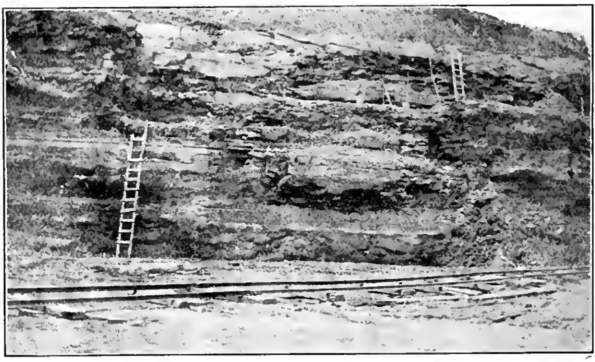

Fig. 43.—Medina shale bank worked for pressed brick by Milton Pressed Brick Co., Milton.

etc. The bank of Medina shale is similar in every way to that at the Toronto Pressed yard. The buff-burning band of shale is also found here. The shale is blasted out by dynamite and hauled in cars to pan mills; the red-burning shale is ground in two pans and the buff-burning shale in one pan. The material is elevated to a screen as before, and that which passes through is pressed in a Boyd machine. The brick are then wheeled directly to the kilns, some of which are down-draft rectangular kilns while others, which are older, are permanent walled up-draft kilns similar to those of the Toronto Pressed Brick works, just described. The first burning is done with wood and the final burning with soft coal. The Medina shale in this yard is overlaid by five to eight feet of a limy grayish red clay. This is dug and mixed with ground shale to ensure a red brick, and is used in the manufacture of wire-cut brick. The mixing is done in a pug-mill which feeds a Weese side-cut machine having an output of 22,000 per day. The brick are wheeled on Bechtel trucks to a Bechtel Carless dryer. These

brick are made for inside walls only, and the output of them is about 2,000,000 per season. The pressed brick plant is run winter and summer, and has an output of one million brick per month. These are sorted into four grades, and are shipped carefully packed in straw. The burning is done in nine kilns and the output keeps a staff of fifteen men continually loading cars, which are placed alongside the kilns.

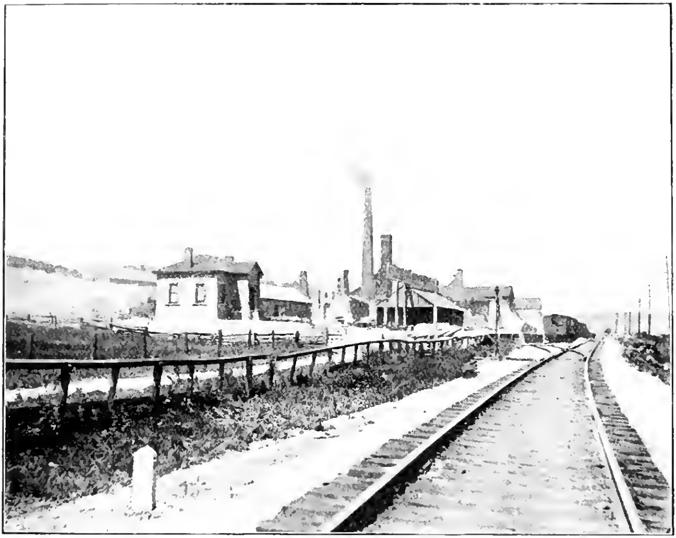

Fig. 44 —Milton Pressed Brick Co's plant, Milton.

Hastings

M. Lingham, Belleville, has three feet of Red-top clay which he uses in the manufacture of red stock brick. Below this is the typical Erie blue clay, but it is not used: the Red-top clay is wheeled to a Martin machine run by horse-power, making five brick at a time; these are hacked out in the ordinary way to dry, and are then burned with wood in open-shed scoved kilns. The output of this yard is about five hundred thousand per season.

E. Naylor, Stirling, has about three feet of Red-top clay underlaid by the Erie blue clay. The upper clay is used in the manufacture of red stock brick which are made in a Martin machine operated by horse-power. The brick are dried in open hacks, and are burned with wood in open-shed scoved kilns. The output of this yard is about five hundred thousand per season.

J. Hill, Madoc, has about two and one-half feet of Red-top clay which is made into red stock brick by the old hand-moulding process. The brick are made in small moulds, one at a time; the clay is mixed by horse-power and two men mould the worked clay by hand. The brick are then backed out in the ordinary way to dry, and are burned with wood in open-shed scoved kilns. The output for the season is about three hundred thousand.

Fargey and Rollins, Tweed: This is the only yard operated at Tweed, those formerly run by Messrs. Lawrence and Countryman having been bought out by this firm. They have about two and one-half feet of Red-top clay lying on blue Erie clay. The Red-top clay only is used for the manufacture of red stock brick and red tile. The brick are made in a Martin and also an Iron Quaker machine, while the tile are made in a Kells machine. The brick are dried in the rack and pallet system, and the tile in open sheds. Both are burned in round down-draft kilns, one permanent up-draft kiln, and in some cases open-shed scoved kilns are used. The burning is done with wood and a good grade of brick and tile is made. The clay being practically free from stones has very little lime in it, and the bricks are seldom burst after burning, as so many of the brick in this part of the country usually are. The output of brick is about five hundred thousand, and of tile about sixty thousand per season.

Huron

Frazer and Logan, Blyth: The Erie blue clay here is overlaid by a mixture of sand and sandy clay. The latter is made into white brick, but the chief output of this yard is in white tile from two and one-half to ten inches in diameter. The clay is dug and hauled by car to a pair of rolls feeding a Kells machine. The tile are cut off by hand and stood in open sheds to dry. The burning is done in three round down-draft kilns, the pockets are built each time of green brick, but the rest of the kiln is usually filled with tile. The water-smoking is done with wood, the remainder of the burning with soft coal. The blue clay here, as in many other yards in the Province, contains small pebbles of limestone. These are often spoken of by brick men as "ginger" probably because when the brick or tile are burned the little white pieces of lime resemble pieces of ginger root, and are, as brick men know, the cause of the brick or tile scaling or even bursting open. Although crushed in rolls, they still cause trouble, for instead of one big piece there are a great number of small ones. To obviate these bad effects, this firm throws in two or three shovelfuls of common salt, a little at a time, with the last three or four fires before cooling down; this kills the lime and thus prevents it doing any harm. The objection will probably be raised that it will glaze the tile, but this is not so, as the temperature reached in the kiln is not sufficient for this purpose. The tile turned out by this firm are smooth, strong and practically free from cracks and scales.

A. Wettlaufer, Blyth: While Messrs. Frazer and Logan are chiefly engaged in making tile, Mr. Wettlaufer manufactures only brick. The blue Erie clay is carted to a Martin machine making white stock brick. These are dumped on pallets and hacked out in the ordinary way to dry. They are then burned by wood in open-shed scoved kilns. This yard is a small one, making only about five hundred thousand brick per year.

Cruse Brothers, Seaforth: This firm uses the Erie blue clay in the manufacture of white brick, tile, and three-spaced hollow block. The clay is hauled by cart and dumped to rolls feeding a Kells machine. Side-cut wire-cut brick are made and are cut off by hand. The die is lubricated to prevent the centre travelling faster than the outside, thus obviating the warping so commonly seen in side-cut brick. Brick, tile and block are all burned together in round down-draft kilns, wood being used for the water-smoking and for the preliminary heating up, and soft coal for the finishing. The output of this yard is about one-half million brick, seven to ten kilns of tile, two and one-half to twelve inches in diameter, and about four thousand three-spaced block. The goods are all of excellent quality.

N. McClarty, Benmiller, has about three feet of Red-top clay, underlaid by about twelve feet or more of Erie blue clay. He uses both kinds, the red for the manufacture of brick, and the white for the manufacture of tile, both of which are made with the Kells machine. About half a million end-cut wire-cut brick are made

from the Red-top clay per season, and about one hundred thousand white tile, varying from two and a half to eight inches in diameter. The brick are dried in hacks and the tile in open sheds and both are burned together in down-draft kilns. Mr. McClarty is making several changes to increase his output.

Eli Elliott, Wingham, works a bank of Erie blue clay, making only white brick. The clay is hauled by cart to a pug-mill which feeds a pair of heavy rolls on a Kells machine. The brick are side-cut wire-cut, and the centre is held back by three iron rods inside the die, the friction of the clay on these helps to equalize the friction of the clay against the sides of the die, and thus prevents the centre from travelling faster than the outside. The burning is done by wood in open-shed scoved kilns.

Crediton Yards. In the immediate vicinity of Crediton is one of the oldest brick districts of Ontario, there being no less than eight yards operated here at present, by the following: **Fred. Kerr, George Hertzel, F. Hist, George Mantel, William Anderson, H. J. Kuhn, Russell Hedden, Wm. Hist.**

All of these yards turn out white brick, as all are manufacturing from the Erie blue clay. Two or three different methods of manufacture are used, and these will be described. Four of the yards use the "slop brick" method. The clay is dug and dumped from carts to a tempering box which is set beside a machine; in this box the clay is well mixed with water and allowed to stand over night. During the forenoon of the next day this soft clay is dug out, and put in a mixing box in which a horse-whim works to mix thoroughly. The soft clay comes out of a hole in the bottom of the box, where it is picked up by one man in masses large enough for one brick and is dropped into a mould. Four moulds are arranged in one block; as soon as these have been filled they are carried off and dumped on a sanded yard, exposed to the sun and wind to dry. This work is continued for half the day, by which time the brick first made in the morning are hard enough to stand handling, when they can be piled in hacks to continue drying. Thus the brick that are made in the forenoon are picked up and hacked in the afternoon; the remainder of the process is the same as for any hack yard, that is, the brick are wheeled in and burned as usual in open-shed scoved kilns.

The other four yards were formerly slop brick yards, but are now operated chiefly for wire-cut brick. Mr. Fred Kerr manufactures both brick and tile. About seven hundred thousand brick and about sixteen kilns of tile varying from three to twelve inches in diameter represent his yearly output. He uses a Kells machine making both end-cut and side-cut brick, the side-cut brick are perforated with thirteen small holes, made by that number of rods set inside the die for the purpose of holding the centre of the clay back in order that the brick will not warp in drying. This number of holes, each about as large as a leadpencil, scattered over the broad surface of the brick, aids the drying and the burning, gives a better hold for mortar and does not weaken the brick, as does the three larger holes so often used in side-cut brick. Brick having three large holes are weak across the centre hole, whereas the thirteen smaller holes do not weaken the brick to any appreciable extent. The tile are burned in two down-draft kilns, and the brick in open-shed scoved kilns. Mr. H. J. Kuhn manufactures brick and tile also. His output of brick is about one hundred thousand per season of both end-cut and side-cut brick. His side-cut brick are perforated in the same way as are Mr. Kerr's, that is, with the thirteen holes. Mr. Kuhn's chief product is tile, of which he makes about four hundred thousand per year, ranging from three to twelve inches in diameter. His tile are perfectly even and smooth, and show that he has this branch of the trade in excellent shape. Mr. Russell Heddon's yard is used chiefly in the manufacture of white brick, both end-cut and side-cut. The side-cut brick are perforated here as usual. He has the largest output of brick in this locality, being about twenty thousand per day. They are all wire-cut and made with a Kells machine. They are dried in open hacks and burned with wood in open-shed scoved kilns.

Kent

John Wardle, Blenheim, has about two feet of Red-top clay lying on Erie blue clay, which is here very thick. The red clay only is used in the manufacture of brick, tile and hollow block. The clay is hauled in carts and dumped to a seven-foot pug-mill which feeds a Martin machine. The moulds holding five brick are dumped on to large pallets, and are dried by the rack and pallet system. The output of brick is about five hundred thousand per season, and are of excellent quality and color. The tile and block are made with a Kells machine, and like the brick are of excellent quality. All three classes of goods are burned by wood in round down-draft kilns.

D. Jordan, Chatham : This yard is situated on the banks of the Thames river. There are from three to five feet of Red-top clay with Erie blue clay below, the Thames itself flowing between Erie clay banks. The Red-top clay only is used in the manufacture of red brick. The clay is carted and dumped to two pug-mills feeding Martin machines. The brick are hacked out to dry and are then hauled on horse trucks and are burned with wood in open-shed scoved kilns. This yard has an output of three million per year, many of which are shipped by boat via the Thames river and Lake St. Clair.

James Cornhill, Chatham : This yard is also situated on the bank of the river Thames, and in addition has the Pere Marquette railway running past one side. This enables Mr. Cornhill to load his brick on either boat or rail at his yard. His output

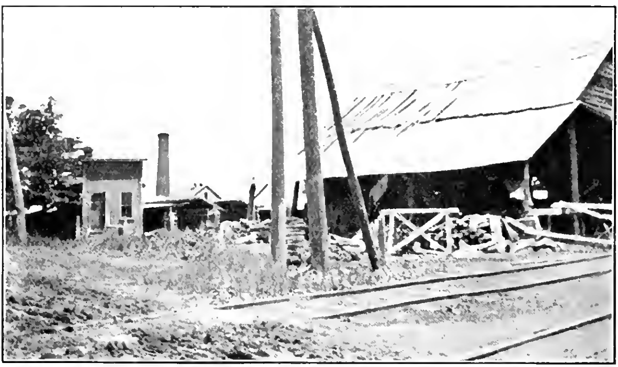

Fig. 45.—General view of James Cornhill's yard, Chatham.

is about five million brick per year. His clay is like that of Mr. Jordan's yard, but he makes two grades of brick. The top three feet of red clay is dug by itself, and hauled by Baird automatic dump car to a pug-mill feeding a Martin machine. This machine turns out red stock only, which are dumped on pallets and dried by the rack and pallet system. The balance of the Red-top clay with a little of the underlying blue Erie clay, making about two feet and one-half in all, is dug by itself and made in another Martin machine, by the method described above, and used for inside brick. The burning is all done by wood and coal in open-shed scoved kilns, which are so situated that the brick can be taken directly from the kiln into the car. Mr. Cornhill has also a Kells tile machine and one round down-draft kiln in which to burn tile. At present he is manufacturing only brick.

J. Hitch, Ridgetown, has over four feet of Red-top clay, but the lower part is rather stony; beneath this is the stony Erie blue clay. He uses the upper part of the red clay for the manufacture of red brick, tile and hollow block. The clay is hauled by cart and dumped to rolls feeding a Kells machine. End-cut brick are made, using a Bechtel automatic cut-off. The brick, tile, or block are wheeled away on a patent truck of Mr. Hitch's own design, which is so constructed that with a slight adjustment it can be used to wheel either of these products. The drying is done in open-shed, and the burning in three round, down-draft kilns. The water-smoking is by wood, and the kiln is then heated up from six to ten hours by wood, after which it is finished with coal. The output is about seven hundred thousand brick, and about three hundred thousand hollow block and tile. The quality of the goods and the color is good, but they could be improved by a more thorough mixing of the clay by pug-mill, as the Kells machine alone cannot be expected to thoroughly mix the clay.

D. Martin, Thamesville, has three and a half feet of Red-top clay almost free from stone, but below this the clay gets more stony as it passes into the Erie blue clay. Three feet of the top clay is dug and heaped to temper, after which it is mixed in a pug-mill which feeds a machine of a plunger type, making stock brick, which are dumped on pallets and dried by the rack and pallet system. Mr. Martin also makes tile and hollow block by a Kells machine. For this purpose the clay is not pugged, as evenness of color and grain is not so essential as in the case of brick. The tile and block are dried in open sheds, and with the brick are burned with wood in round down-draft kilns. His output is about five hundred thousand brick, and about two hundred thousand tile and hollow block.

G. Moody, Highgate: Mr. Moody, an ex-President of the Clay Workers' Association of Ontario, operates this yard, which is one of the neatest and handiest yards seen in the Province, and the brick, tile and hollow block are of excellent quality. Mr

Fig. 46.—Geo. Moody's Yard, Highgate, showing open hacks with pivoted roofs, filled with hollow blocks; also Bechtel dryer.

Moody has about three feet of Red-top clay, which becomes sandy towards the bottom and passes into sandy Erie clay. The clay is hauled by automatic dump cars to a Baird pug-mill, which feeds a pair of rolls on a Kells machine. The brick are cut off by a Bechtel automatic end-cut table, and are allowed to run over an oiled roller, which by oiling one surface permits the brick in drying to shrink on each other, without pulling apart and cracking. The brick are wheeled out in Bechtel trucks to a Bechtel Carless dryer, and are then wheeled from the dryer to three round down-

draft kilns. The water-smoking and six hours of burning are done with wood, after which soft coal is used. For tile and hollow block a Kells machine is used in the ordinary way. The walks throughout this yard to the kilns, etc., are granolithic. In fact, Mr. Moody's yard is one of the most up-to-date in the Province.

Lambton

Martin and Company, Alvinston: The clay in this yard is an Erie blue clay, sandy in the upper part. Lower down the clay is much stronger, and practically free from sand. Above the Erie clay is about six feet of fine gravel; this is taken away by the public for road metal and building purposes. The sandy blue clay is used for the manufacture of white sand stock brick, about five hundred thousand of which are made per season. The stronger blue clay is used for the manufacture of tile, which are of good color and very strong, about two hundred thousand being made per season. The Erie blue clay extends continuously down to shale, which has the following composition:

	Per cent.
Silica	66.82
Alumina	11.68
Ferric Oxide	6.58
Lime	.62
Magnesia	.90
Soda	.38
Potash	2.58
Loss by Ignition	10.59

F. Howlett, Petrolia, has from two to six feet of Red-top clay lying in a hollow which accounts for the great depth of red clay here, as it has been concentrated from the surrounding hills. Mr. Howlett's former brick plant is now a pumping station for a series of oil wells. In his new yard are several wells in operation. He makes red stock brick, using a Quaker machine, and also red wire-cut brick and red tile with a Kells machine. His burning is done by wood in two round down-draft kilns, the output being about three hundred thousand brick and about two hundred thousand tile per season.

H. Hales, Brigden: Mr. Hales has been making brick for about forty years, and has been largely responsible for some of the best methods of brick-making and burning now in use in Canada. He has about five feet of Red-top clay lying on Erie blue clay, which he has found to be 117 feet deep here. These two clays are situated on a high hill, past the foot of which flows a river with a broad low flat for its other bank. On this flat is an excellent deposit of red alluvial clay, which is used for the manufacture of red brick. They are made in a Quaker machine with a pug-mill attached for mixing. The brick are hacked out in the ordinary way, and are burned with wood and coal in an up-draft kiln. The brick are of a deep red color, and of an excellent quality. Leading from the top of the hill across the river to the low flat on the opposite side is a tramway up which Mr. Hales hauls the alluvial clay by Baird cars to a pug-mill which feeds a Kells machine and uses it to make tile, varying from three to fourteen inches in diameter. Mr. Hales uses a very ingenious device for transferring his tile to the upper story of an adjoining building: on a broad belt which turns about four-foot pulleys, he has nailed shingles, with the thick ends together, so as to form a horizontal set of steps on the belt. As this belt slowly turns he sets a tile on end on each step, it is thereby elevated and carried to the adjoining building, thus obviating the lifting of the tile or wheeling them up by hand. Mr. Hales burns a round down-draft kiln, and in a rectangular down-draft kiln. These were built many years ago by Mr. Hales from his own plans, and the round one is in reality the same as the Cornell patent kiln, which has become so popular. Previous to building his rec-

tangular kiln. Mr. Hales built a very small kiln which would hold about five thousand brick, and strange to say this experimental kiln is almost identically like the latest patent kiln: finding that the small one worked perfectly, he built the large rectangular kiln which is still in use in his yard, and this kiln is in almost every particular identical with the Stewart kiln. This yard is filled with small labor-saving devices, and with appliances for improving the quality of the goods or increasing the output.

A. Elliott, Thedford, has about eight to twenty feet of Erie blue clay, underlaid by a blue Devonian shale, both of which have been cut and exposed by a small stream known as Decker creek. At a point where the blue clay was shallow, being not over eight feet deep, the Devonian shale was bared (see fig. 5), the high water of the creek in spring time performing a great deal of the work itself. At the contact of the Erie clay with the shale are many boulders, showing the lower part of the Erie clay to be a typical boulder clay. This Devonian shale is ploughed about six inches deep in the early spring and allowed to slake, and is then carted to a pair of rolls feeding a Kells machine. These rolls are necessary because the shale is filled with concretionary nodules and abundant Devonian corals, for example:—Zaphrentis, Cystiphyllum, Heliophyllum, Favosites, Crinoidea, and Spirifera mucronata, and many others. As the clay slakes these are found in abundance scattered through it. In addition to these are many small pieces of selenite, that is, calcium sulphate, the presence of which would hurt the clay for brick by causing an efflorescence, or white coating often called "soda," which appears on the brick after they are burned. The following is an analysis of this shale:—

	Per cent.
Silica	54.96
Alumina	19.15
Ferric Oxide	6.68
Lime	4.02
Potash	3.47
Sulphur Trioxide	.93
Loss by Ignition	8.48

It will be seen from this analysis that the percentage of sulphur trioxide is very high as compared with other clays and this feature would be very objectional in brick. It can, of course, be overcome by the addition of a barium salt which would form barium sulphate, this compound not being soluble would not discolor the brick.

This clay is particularly suited to the manufacture of tile and it is for this purpose that Mr. Elliott uses it. The tile are of excellent quality, being hard, even in grain, and very strong. The green tile can be stood in the rain without suffering any damage. This clay was used in the Toronto Exhibition for the manufacture of tile by H. C. Baird & Co. of Parkhill, in one of their Kells machines, when a tile twelve feet long was made and shoved along a board without cracking, thereby showing the tensile strength of this clay. The tile are burned to a beautiful dark red color in six days, the burning being done with wood in round down-draft kilns.

Lanark

G. A. Burgess, Carleton Place, has from three to eight feet of Leda clay, of which he uses only the upper three to four feet, that below being too wet. The clay is dug and mixed with sand as it is loaded to a car, hauled by horse to a Quaker machine making five brick at a time. These are dumped on a pallet and set in racks on cars which are run down the hack yards. The brick are then dried by the rack and pallet system, after which they are piled on cars three hundred to a load, and are run to the kiln yard, where they are burned with wood in open-shed scoved kilns. The burning is splendidly done, even the arch brick being easily saleable. The output

of this yard is fourteen thousand per day, and the power used is a 16-h.p. gasoline engine, which for this quantity of brick uses $1.15 worth of gasoline per day, and has the additional advantage that having been once started it needs little or no further attention.

Robert Scott, Perth, has from three to five feet of Red-top clay, in places quite stony. This overlies Erie blue clay, which is also stony. The red clay is used for the manufacture of red stock brick in a Martin machine, using horse power. The brick are hacked out in the old way, but Mr. Scott contemplates an early change to the rack and pallet system. The blue Erie clay is used for the manufacture of white stock brick, which are the finest brick of this class seen in the Province. This perfection is reached by washing the clay, the only way to get rid of the limestones and other pebbles so commonly found in Erie clay. This is a very common process in England in the manufacture of brick. A circular pit about twenty feet in diameter and probably three feet deep is lined with wood, brick or cement; at some point in the circumference about one foot and one-half from the top is a small gate which can be opened or closed at will. In this pit is a horse-whim pivoted at the centre, the beam reaching over the edge of the pit so that the horse can turn the whim. Suspended from the beam on either side from the centre is a wooden frame set with teeth much resembling those of a harrow. The stony clay is dug and dumped into this pit, water is then run in until the whole mass is semi-liquid, and the horse is started. In travelling round and round these drags agitate the whole mass, all stones, hard lumps, etc., sink to the bottom of the pit; the gate is then opened, and the upper slimes are run off. They can be deposited on level ground where they will naturally drain themselves and can be worked afterwards like an ordinary clay deposit. Mr. Scott does this work in the fall of the year when brick-making has ceased, and thus has a deposit of clay ready for the next season's work. Contractors are ready and willing to pay for a better quality of brick, provided they know they can be supplied with a uniform grade, and Mr. Scott has no trouble getting one dollar and a quarter per thousand more for this grade of white brick than he or others in the section can get for red brick, or white made from unwashed clay. The washing can be done for 35 to 50 cents per thousand.

M. Ryan, Smith's Falls: Situated on the bank of the Rideau canal, Mr. Ryan can work about five feet of Red-top clay down to water level. Below this is Erie blue clay as usual, and some of this was formerly used for the manufacture of white brick, but now the Red-top clay only is employed. This is collected by wheeled scrapers and dumped on a mixing floor. The necessary amount of sand is added for tempering, when the clay is dumped in a hopper and carried by an endless chain conveyor to the top of the mill, and dropped into a pair of rolls which feed a Baird pug-mill that in turn feeds a Martin machine. The brick are then dumped on pallets and dried by the rack and pallet system. The moulding sand is mixed with red oxide of iron which improves the color and aids the "shifting;" this costs about two and a half cents per thousand, but has the disadvantage that in handling after burning some of the red oxide rubs off, thereby making the contrast in color more noticeable. The brick are burned with wood in open-shed scoved kilns, and the output is about one million per season. The power used on this yard is electricity, and gives excellent satisfaction, as it can be started or stopped on a moment's notice, and when once started needs no further attention.

Leeds

R. J. Wilson, Gananoque, has from two to four feet of Red-top clay, which is very strong and practically free from stone. This is wheeled to two tempering pits, each capable of holding a day's run, thus while one is being emptied the other is being filled and allowed to slake and temper, the required amount of sand being added for this purpose. Water is then added, and the mass is allowed to soak over night.

From these pits the clay is wheeled to a Quaker machine making five brick at a time. these are dumped on pallets and dried by the rack and pallet system. The burning is done with wood in open-shed scoved kilns. Mr. Wilson is contemplating the use of round down-draft kilns next season. He uses a fifteen h.p. gasoline engine, which makes nine thousand brick per day and requires only five gallons of gasoline.

W. H. Wood, Brockville, has from three to five feet of Red-top clay overlying the Erie blue clay as usual, but the latter is not used. The Red-top clay only is used in the manufacture of red stock brick. The clay is carted to a pug-mill, which feeds a Quaker six-brick machine. The brick are dried by the rack and pallet system, and are burned in open-shed scoved kilns with wood as fuel. Mr. Wood also uses red oxide of iron in his moulding sand to improve the color and aid the shifting. He has also a Kells machine, and will add tile and wire-cut brick to his output.

Lennox

Geo. Whittington, Napanee: This yard is located in a hollow or gorge below a limestone ridge, and has a very fine deposit of clay. In addition to the ordinary Red-top clay resulting from the weathering of the underlying Erie, there is here an additional concentration of clay from the higher ground, which increases the layer of red-burning clay until with the little sand it contains it is nine feet deep. This admixture of sand makes the clay most desirable for stock brick, and since it is the result of washing from higher ground, it is practically free from stone. The clay is dug and dumped directly into a Martin machine run by horse power; the brick are dried by the rack and pallet system and are of excellent quality. Mr. Whittington has also a Kells machine run by steam power, and makes red tile from the stronger bands of the red clay. The brick and tile are both burned in round down-draft kilns of a large size, being six feet high and twenty-five feet across, inside measurement. The burning is done with wood, and the season's output is about five hundred thousand

Lincoln

J. M. Carter, St. Catharines, has about two feet of Red-top clay underlaid by the usual blue Erie clay. The Red-top clay is made into red stock brick with a Martin machine. The brick are dried by the rack and pallet system and burned in open-shed scoved kilns with wood at first, and finished with coal. The underlying Erie clay is manufactured into white tile. The clay is allowed to dry in the sun, and is then dumped into a Bechtel disintegrator which pulverizes the clay and throws out all stones larger than a pea. The product of the disintegrator passes through a pair of rolls feeding a Kells machine. This pulverizes all the smaller stones. The Bechtel automatic cut-off is used for end-cut brick and a hand cut-off for tile. The brick are wheeled out by the Bechtel trucking system to open sheds, and when dried are burned in open-shed scoved kilns. The water-smoking and first heating is done with wood, and the remainder with soft coal. The output for the season is about one million and a half.

Watt and Smith, Attercliffe: The clay in this yard is somewhat stony; but the upper two feet of Red-top clay is more or less free from stone, and is dug and piled in heaps and allowed to slake, when it is fed to rolls which in turn feed a Monarch six-brick machine. The brick are dried by the rack and pallet system, and are burned with natural gas in open-shed scoved kilns. This company was burned out this spring and this accounts for the very simple plant they are now operating. Previous to the fire they had a very complete plant, the clay being dug, pulverized with a pair of rolls which fed a Monarch machine. The brick were trucked by the Bechtel system to driers using a forced draft, which was heated by natural gas, the output at that time being about two million per year. The plant which they are now operating will shortly be improved. This firm has three flowing gas wells in its yard, and these are

used in all parts of the yard requiring heat. The power for example, is got from a steam engine, the boiler of which is heated by gas. A pipe leads beneath the boiler, the jet is lighted in the morning and once steam is up, the taps can be so adjusted as to require practically no attention for the remainder of the day. In burning the brick, an ordinary scoved kiln is built, in every way similar to those ordinarily built for wood or coal. Into either end of each arch an inch pipe leads; this extends not more than a foot. The doors are closed up, with the exception of a draft of about an inch around the pipe; the quantity of gas can then be regulated by taps just outside the doors. The brick are very uniform in color, and are of an excellent quality; the arch brick cannot be told from any of the others, all being alike in hardness and color This is a very unique yard.

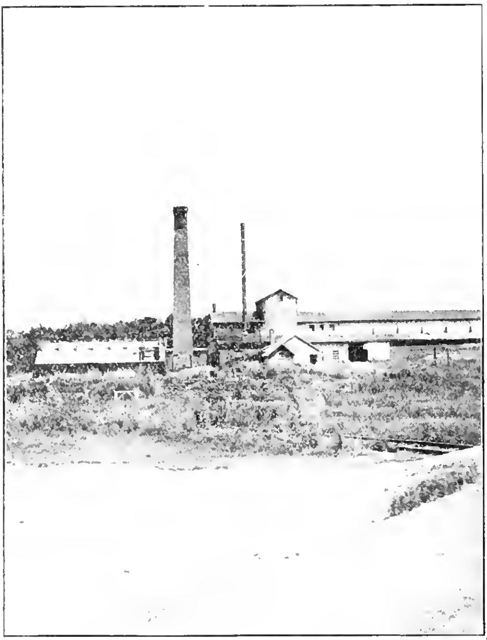

Fig. 47.—Plant of Beamsville Brick and Terra Cotta Co., Beamsville.

George Crain, Beamsville, operates the Beamsville Brick and Terra Cotta Company, which manufactures red pressed brick, and buff pressed brick, all sorts of fancy ornamental brick, and side-cut wire-cut brick for inside walls. The red Medina shale which outcrops here is used in the manufacture of these goods. The more or less decomposed surface shale is ploughed up, and allowed to slake further This shale has the following composition:—

	Per cent.
Silica	55.90
Alumina	18.46
Ferric oxide	6.60
Lime	3.82
Magnesia	2.65
Soda	.53
Potash	3.55
Sulphur trioxide	.31
Loss by ignition	8.74

The shale is fed to one pan mill, from which it is elevated and screened to a hopper, the over size returning to be ground again. From the hopper the ground shale feeds two Simpson dry presses. The burning is done in six down-draft kilns, two of which are round, and four rectangular. The preliminary burning is done with coke, and the remainder of the burning with soft coal. For the manufacture of the inside brick the ground shale is dumped to a pug-mill, which feeds a large auger machine of German manufacture, making side-cut brick. Thirteen brick are cut off at a time; these are then piled on steel cars (see fig. 33) four hundred and fifty to a load, and are run into long drying tunnels through which a draft of warm air is forced by a fan; the air is heated by passing through hot arches built of brick and heated with coal. At the end of twenty-four hours the dried brick on the same car are run out to the kilns, where they are water-smoked with coke, and finished with coal. The burned brick, especially the pressed brick, are sorted into four grades and are shipped as such. The dry-press plant has a capacity of thirty thousand per day, and the wire-cut plant an output of twenty thousand; the quality of brick made by this company is excellent, and the yard very neat and tidy.

Middlesex

H. James, Delaware, manufactures white end-cut wire-cut brick and tile from a fine bank of Erie blue clay. The clay is carted to a pair of rolls which feed a Baird pug-mill, which in turn feeds a Kells machine. A Bechtel automatic end-cut machine is used, and Bechtel trucks for wheeling out to open air-drying sheds. The tile are wheeled out and dried also in sheds. They are of excellent quality, and very smooth, hard and free from checks and cracks. The burning is done in two down-draft Stag kilns, rectangular in shape, the chimney being between the two and serving for both The burning is done with wood.

James Richardson and Son, Kerwood, manufacture white brick and tile from the Erie blue clay. The clay is hauled by car and cable to a pug-mill feeding a Martin machine. The brick are wheeled out and dried in open sheds, and are then burned in large up-draft permanent-walled kilns. These are covered by a long kiln shed, along one side of which is the wagon road, and along the opposite side the railway siding, so that the brick can be loaded from the kilns right into the car. A separate plant is used for the manufacture of tile, which are made in a Kells machine producing all sizes from three to nine inch. These are cut off by hand, and elevated by an endless chain elevator to an upper floor where they are lifted off and wheeled away to dry They are burned by themselves in a round up-draft kiln, using wood for fuel. The output of brick from this yard is about one million, and of tile about three hundred thousand.

C. G. Frank and Sons, Strathroy, manufacture end-cut wire-cut brick only from the Erie blue clay. The clay is dug and carted directly from the pit to a pair of rolls feeding a Kells machine. A Bechtel automatic end-cut cut-off table is used, and the brick are trucked by the Bechtel system to open sheds and hacks to dry. They are then burned in open-shed scoved kilns using wood for the water-smoking and first burning, and coal afterwards to finish. The output of this yard is about eight hundred thousand per season.

H. C. Baird and Son, Parkhill: This firm manufactures brick machinery, including pug-mills, rolls, Quaker brick machines, Kells tile and brick machines, automatic dump-cars, etc., and also takes the contract for building the Cornell patent down-draft kiln, in fact for fully equipping a brick yard. In addition to manufacturing brick machinery, Mr. Baird operates a brick yard, where all these machines can be seen at work. He has two feet of Red-top clay underlaid by sandy blue Erie clay, followed by a strong blue Erie clay. The upper sandy part is worked into stock brick; this is dug, hauled by Baird cars to two pug-mills which mix thoroughly. From this it feeds to an iron Quaker machine. The brick when dried are burned in two round down-draft Cornell kilns, the output being about one-half a million white brick per season. The stronger under Erie clay is hauled by car and used in the manufacture of white tile, hollow block and wire-cut brick. This clay, which is somewhat stony, is put through a pair of rolls feeding a Kells No. 1 machine. Tile are made from three to twelve inches in diameter, hollow block of one- and three-spaced patterns, also end-cut wire-cut brick. These are burned in round down-draft Cornell kilns. The output of this yard is not large, Mr. Baird's idea being to supply the local market only, and to have a place where the working qualities of his machinery can be shown. A glance over the yards of the Province will show the popularity of Mr. Baird's machinery, especially the pug-mills, and Kells tile and brick machines.

J. W. Cawrse, Walker and Logan, John McLaughlin, Waide Bros., Warwick and Son, London Brick Manufacturing and Supply Company, London.

The clay in use at these London yards is somewhat different from that found in the other yards of western Ontario. It here seems to be a local collection of more recent age than the Erie, as it is found on the surface overlying the true Erie clay below, as shown by borings and wells (see fig. 22). The area is possibly an expansion of the old Thames drainage basin; at any rate the clay is here inter-stratified with bands of sand, sandy clay, and blue quick sand; in some cases, even gravel bands are found. For example at Waide Bros.' yard the following section is shown:—

Gravel (stratified)	6 feet
Strong reddish clay	3 feet
Sand	3 feet
Sandy clay	4 feet
Strong blue clay	1 foot
Quicksand	1 foot
Blue clay	

From the above section it will be seen that this is an entirely different clay from those met in other parts of the Province, and is purely a local accumulation. The gravel is cleaned from the top of the clay and carted away for road metal. This not only exposes the clay but is a source of revenue to the owners of the yards, as they receive 10 cents a load for the gravel. The ten feet of clay, sand, etc., down to the quicksand is wedged off and thoroughly mixed, with the result that an excellent quality of white brick is turned out by all these yards. The general method of manufacture is about the same for all of them; two or three examples will suffice.

The London Brick Manufacturing and Supply Co has a very fine new plant, turning out thirty thousand brick per day, or about three million for the season. The section of clay is dug as described above, hauled in dump cars and dumped into a Raymond machine. This is an American machine which resembles the Monarch made by Baird and Son of Parkhill. It is a very powerful machine with a good pug-mill attachment, and makes six brick at a time. These brick are dumped on pallets which are piled on cars carrying three hundred and thirty brick at a load. These cars are run into long tunnels, through which a blast of hot air is forced by a fan. The cars all enter at one end of the tunnels, which is also the cooler end, so that the green

brick get least hot draft while they are wettest. As the dry brick are taken from the opposite or hotter end of the tunnel, each car moves down one length, so that at the end of forty-eight hours each car of brick is dry; the cars are then run into the large open up-draft kilns, three in number. These kilns have permanent side walls in which are placed the fire arches. Each kiln has twenty-five arches and is capable of holding five hundred thousand brick. The ends are open so that the kiln can be filled to any extent and scoved up as usual. (See fig. 35.) The burning is done with coal, and the water-smoking with wood. This is a new plant and one of the best seen in the Province.

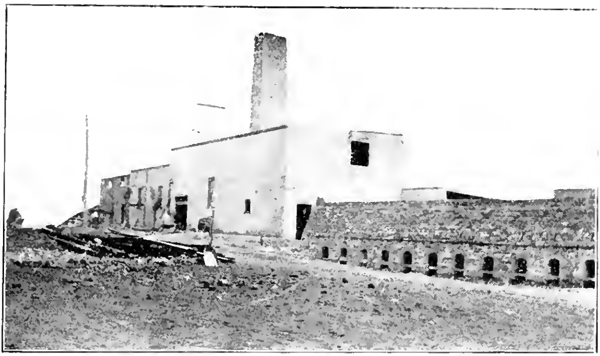

Fig. 48.—Plant of London Brick Mfg. and Supply Co., London.

Walker and Logan manufacture about one million and a half white sand stock brick per season. Their clay is wedged off as described above, and thoroughly mixed in a Baird pug-mill, which feeds a Monarch machine making five brick at a time. The clay here is very sandy, and the brick have a tendency to lose their shape when wheeled out to the drying-shed. To overcome this the moulds are piled on barrows, eight to a load, and wheeled to the rack yard; here they are dumped on a pallet and set in the racks to dry. From here the brick are hauled on a truck waggon to open-shed scoved kilns, and to one sixteen-arch permanent-walled up-draft kiln. This is used, especially in the fall when the weather is bad and for the last big burn of the season; the water-smoking is done with wood, and the remainder with coal.

Waide Brothers operate a very neat, tidy yard. The section of clay is wedged off from top to bottom, and is hauled by car and cable to the machine house, where it is thoroughly mixed, and made into white stock brick. These are taken in the mould to the yard and dumped there for the reason given above. When dried, they are hauled by horse truck to open-shed scoved kilns, and one long permanent-walled up-draft kiln, for use in the fall and bad weather. This firm also manufactures a few tile. The upper band of strong reddish clay three feet in thickness is dug by itself and made into an excellent quality of tile with a Kells machine. It is much too strong, however, to be used alone for brick. The tile are burned with wood and coal in one round down-draft kiln. The output of brick is about one million and a half per season, and the tile are made as ordered

Muskoka

Watson and Hutchison, Bracebridge : The clay found in the Bracebridge yards is typical Saugeen clay described in the first part of this report, that is, a finely laminated reddish brown clay, and reddish sand, the bands of which are rarely over three-quarters of an inch in thickness. This yard is situated on the top of a hill, in which the clay is from fifteen to twenty feet thick, and is underlaid here, as in other places, by white quartz sand. The gray bands of sand make this clay just lean enough to work well. The upper three feet of this bank contains many concretion-like nodules, which are of a shaly nature and very hard, and unless they are allowed to slake by digging the clay and exposing it to the air, or are crushed by being put through a pair of rolls, they go through the brick machine, and as hard lumps in the brick act like pebbles, bursting the brick either before or after the burning.

No. 49.—A 45-h.p. water wheel installed by Mr. Watson, Bracebridge, with which he operates his whole brick plant at a cost of about 10 cents per day.

Below this yard is a small stream with a small fall, and here a little water wheel has been erected by Mr. Watson (see fig. 49), which generates forty-five horse power. The power is developed and transmitted by a cable to the yard, a distance of about one hundred and fifty yards. The clay is dug and dumped in a bucket which is raised by a cable to a track along which it is carried and dumped to a hopper. (See fig. 26.) This hopper dumps to a Baird pug-mill feeding a Martin machine. The brick are dried

by the rack and pallet system, and are burned with wood in a permanent-walled up-draft kiln, and in open-shed scoved kilns. A new Kells tile machine has lately been installed for the manufacture of tile, hollow block, and wire-cut brick. These will be burned in round down-draft kilns now in course of erection. The plant as a whole is one of the neatest and most economically run in the Province; for example, the power necessary to manufacture thirteen thousand brick per day has been calculated, and found to cost less than ten cents per day. This plant is a comparatively new one, but with the cheap power and the fine deposit of Saugeen clay should have a bright future. The main difficulty to be overcome is the crushing of these nodular pieces mentioned above. This can be done either by slaking, which is a slow process, or better still, by rolls.

Bracebridge Brick Company, Bracebridge: This yard is also situated on Saugeen clay in every way like that at Watson and Hutchison's yard. The clay is finely laminated with grayish sand, and in places reaches a depth of twenty-two feet. Below this is white quartz sand, which has been found in so many places underlying the Saugeen clay. The surface is ploughed and is left to slake, after which it is mixed with a little more sand and is heaped close to the machine. The clay is then worked in an Iron Quaker machine making six brick at a time; these are dried with the rack and pallet system, and are burned in open-shed scoved kilns. This clay also contains many of the objectionable concretion-like nodules. The brick made in this yard are of good quality, and the output is about seven hundred thousand per season.

Nipissing

Wallace and Son, North Bay: Saugeen clay occurs at this yard in a bank varying from three to ten feet in depth, and rests immediately on the polished granite surfaces of the old Laurentian formation. Most of the country about North Bay is bare and rocky, with the hollows usually filled by sand, gravel, and occasionally Saugeen clay. It is one of these hollows, with a variable depth of Saugeen clay, overlaid in places by a foot or two of red sand, that is worked for a brick-yard. Such hollows are comparatively rare, and especially hollows with clay sufficiently clean and free from over-burden of sand and gravel. The underlying layer of Erie clay usually found in other parts of the Province is entirely wanting here.

The clay is dug to a heap and allowed to slake, when it is wheeled to a Martin machine run by horse-power. The brick are dried in open hacks and burned with wood in open-shed scoved kilns as usual. The output for a season is about 800 thousand, all red. These brick are of good quality, but burn a little light in color. The analysis of this clay is No. 64 under Saugeen Clays, page 26 of this Report.

Standard Clay Company, North Bay: In another hollow this company have started the manufacture of brick, and built a more modern plant. They have the usual section of Saugeen clay with sufficient sand to render the whole quite workable. This clay is dug and carted directly to a Hercules machine. The excellent pug-mill attachment on this machine is of great service in thoroughly mixing the sand and clay. The brick are dumped on pallets and piled on steel cars, which are then run into tunnel dryers of the Sheldon and Sheldon type of Galt, Ontario. After drying for thirty-six hours, they are taken from the opposite end of the tunnel and burned in open-shed scoved kilns with wood as the fuel. Red brick only are made, and the output for the season is about one million. This plant is a very modern one, and with the brisk demand which the influx of people to New Ontario is causing, it should have a very much increased output in the near future. It may be further added that there is very little clay near North Bay save that worked by these two companies.

The Liskeard Brick, Coal and Lumber Company, New Liskeard: This is a new yard recently opened to supply the demand for brick in New Ontario, but the deposit is not uniform in character from top to bottom. The first six feet of typical interbanded

Saugeen clay burns to a rich red color. The next four feet or so does not burn so rich a red, but rather a pinkish shade. Below this is a very blue laminated clay, free from stones, but containing considerable quicksand. This blue clay burns to a creamy white brick All these clays are very strong, so much so that they are only worked with the greatest difficulty. The drying is especially difficult, and if the brick be exposed to direct heat or draught, the outside dries so much more rapidly than the inside that the brick break badly. This could be largely overcome by the addition of red sand to the red clay, and gray sand to the blue clay; but unfortunately this sand is difficult to find. At present the clay is dug and hauled by truck wagon to a pug-mill, which feeds a Doig machine, making five brick at a time. The brick are dumped on pallets and set in large racks in a covered shed, or really a dry kiln, since this clay will not stand wind or sun drying. The sheds are closed in and a series of coils, steam heated, is placed in the floor. A little steam is even liberated into the tunnels at first, to prevent the outside of the brick drying too rapidly for the inside. The dried brick are burned with wood in open-shed scoved kilns.

In this yard there is also a Kells tile machine for the manufacture of tile, hollow block, and wire-cut brick. The wire-cut brick are trucked out by the Bechtel trucking system to open shed-dryers, after which they are burned in the usual way in open-shed scoved kilns. The output for this yard is expected to be about a million brick per season. They will make both red and white brick, and both sand stock and wire-cut brick. The yard is not in full running order, however, as yet. The analysis of this blue clay at the base of the Saugeen proper is given as No. 66, page 26 of this Report.

R. Scott, New Liskeard: Mr. Scott operates one of the first yards ever worked in New Ontario. He has the usual section of Saugeen clay, which he has been in the habit of digging over and allowing to slake, after which it is worked in a Martin machine using horse-power. The brick were dried by the hack system and were burned with wood in open-shed scoved kilns. This was a small yard with a yearly output of about 300,000. The building of the T. & N. O. railway rather damaged Mr. Scott's yard by running through it, thereby cutting off his supply of clay, but he has now crossed the railway and is establishing a bigger and better yard there. He is installing a new machine with the rack and pallet system of drying, and will no doubt increase his output materially. The analysis of his Saugeen clay is given as No. 65, page 26 of this Report.

The Imperial Land Company, Sturgeon Falls: This large plant was built some years ago by the Sturgeon Falls Power Company, now the Imperial Pulp and Paper Company. It was built for the manufacture of the brick required in the power houses, factories, offices, etc., required by this company at Sturgeon Falls. They have since continued to operate the yard for the manufacture of brick for the local market. The clay in this yard has given considerable trouble. There are in reality three different classes of clay in the deposit. Starting at the surface we find a layer of stiff blue clay about three feet thick. It is free from the inter-laminations seen in the Saugeen clay. It is also free from stones, but contains considerable quicksand. This clay, if dug and worked by itself, will yield a buff brick, and it should be worked by itself if used at all. At any rate, it should be kept out of the underlying laminated clays.

Immediately beneath this blue clay we have the Saugeen clay, the upper part of which is composed of alternate bands of a blackish brown clay, with gray clay, while the lower part of the bank is composed of bands of a rich chocolate brown clay with a dark gray clay. Both of these latter clays will burn to red brick, but are rather too fat of themselves, and would yield much better brick if mixed with about 25 per cent. of red sand. These three clays are at present dug to heaps where they are allowed to slake. They are then carted and dumped to a pug-mill feeding an Iron Quaker machine, making six brick at a time. The brick are dumped on pallets

which are piled on steel cars, and are then run into the tunnels of a Sheldon and Sheldon drier, where they are allowed to stand in a hot draft for thirty-six hours, after which they are burned with wood in up-draft case kilns, of which this company has three. The output is chiefly of red brick, but some white ones are also made. The total output for the season is about two million. The analysis of the upper blue clay which burns buff is given as No. 10, page 14. It is not an Erie clay, but like the latter burns white. The analysis of the nnderying Saugeen clay at this yard is given as No. 56, page 26 of this Report.

Norfolk

C. Mason, Simcoe, has the Red-top and underlying Erie clay, both rather sandy. The Red-top clay is used for the manufacture of brick, and the Erie blue clay for the manufacture of tile and end-cut wire-cut brick. The Red-top clay is made into stock brick by a Martin machine, the moulding sand is mixed with red oxides to improve the color, and aid in shifting, the brick are hacked out in the ordinary way to dry, and are burned in open scoved kilns and in round down-draft kilns. The white clay is worked by a Kells machine into tile and wire-cut brick, which are burned in the same way. The clays of this district are rather too sandy to turn out first-class goods. Mr. Mason has about three feet of good strong clay at the surface overlying sandy clay.

Northumberland

H. Hall, Cobourg, has been making brick for a great many years, during which time he has introduced many little devices for improving the products of his yard. He has about three feet of Red-top clay, which is dug in the fall, heaped over winter and allowed to freeze and slake. It is then manufactured in a Martin machine turning out five brick at a time. The drying is done by the rack and pallet system, and the brick are burned in scoved kilns; it is in this department that Mr. Hall has made his chief improvements. On top of the platting he places hard coal screenings in such position that at the desired time they can be allowed to trickle through the platting into the kiln, these screenings are placed over those parts only of the kiln which do not burn hard enough under ordinary conditions. This as a rule is around the walls and in order to allow the coal to trickle well down into the brick a row of "scintlers" are placed all around the kiln from the "checker" to the top. At intervals a little of the screenings are allowed to trickle down, and the burning of this coal causes a little additional draft in those parts which otherwise would have been under-burned. Mr. Hall has had first-rate results in this way, as he is able to tear down the scoving and start at once and ship face brick, hard brick being burned right to the heads. At the time of the writer's visit to this yard, a kiln had just been finished, the scoving was torn out and the very first brick were of excellent quality, and quite hard enough for outside brick. His output for the season is about six hundred thousand.

Jex and Company, Cobourg: This firm are building contractors, and manufacture brick almost entirely for their own work. They make red brick only, using the Red-top clay which is about two and one-half feet thick in this yard. The clay is heaped in the fall and worked the following spring to stock brick, using a Martin machine and horse-power. The brick are hacked out in the ordinary way, and are burned with wood in scoved kilns

Oxford

Odell and Son, Ingersoll, uses the Erie blue clay in the manufacture of white brick, three-spaced hollow block, and tile from three to twelve inches in diameter. The clay is dug and dumped to a pair of rolls feeding a Kells machine. All the goods are made by this machine. The brick are side-cut, wire-cut, the flat-faced being perforated with three holes. The chief output is tile, especially large sizes. The Erie

clay here is excellently suited to the manufacture of tile. The power used here is a twenty-five h. p. gasoline engine, which Mr. Odell claims is a great saver of fuel and attention. The goods are burned in two excellent round down-draft kilns, the water-smoking is done with wood, and the first of the firing up is also done with wood, after which soft coal is used with the result that the goods are very hard, and of a beautiful cream white color.

Wm. Marshall and Son, Woodstock, use Red-top clay only in the manufacture of side-cut wire-cut brick, employing a Close machine which was made at Woodstock. The clay is dug in the fall and heaped near the machine; it is tempered with water containing red oxide of iron, which aids the color materially. The side-cut brick are perforated with three holes in their flat surface to prevent them from warping during drying. The brick are dried in open sheds and are burned with wood in kilns having the two side walls which contain the fire arches built permanently, while the ends are left open and scoved up whatever size required. (See fig. 35.) The brick turned out are of good quality, being quite hard and of dark red color. The output is about eight hundred thousand per year. The Close machine is of a plunger type which avoids the curly or rolled centre so commonly seen in wire-cut brick made in auger machines, but it has one defect especially for working Canadian clays, in that the die is lined with cloth which soon wears unevenly causing the brick to be mis-shapen Especially does it wear out in working our gritty and more or less stony Erie clay, and this is the class of clay usually manufactured into wire-cut stock.

E. Cherret, Woodstock: This yard was also visited, but is in every way the same as Marshall's. The same class of clay is used, and the same system of manufacture followed throughout.

Deller and Son, Norwich, has about two feet of Red-top clay underlaid by Erie clay. Both are used, the top clay for the manufacture of red brick, and the lower clay for the manufacture of white tile, three-spaced hollow block, and wire-cut brick. The clay is carted to a Baird pug-mill which feeds a pair of rolls on a Kells machine, the Bechtel automatic cut-off is used for brick, tile, and hollow block. Tile up to eight inches in diameter are cut off by this machine; above this size they are cut off by hand. The output of tile is about three hundred thousand, more particularly the large sizes. About sixty thousand three-spaced hollow block are made per season, and a few red and white brick, but this part of the trade is left largely to the next described yard at Norwich Junction. The brick, tile, and hollow block are all burned in down-draft kilns, one round and one rectangular, the water-smoking and first burning is done with wood, and the remainder with soft coal. All in all, this is an excellent yard, turning out first-class clay products.

James Irwin, Norwich, has from two to three feet of Red-top clay, below which is the Erie blue clay as usual. The top clay is made into red brick by a Kells machine. The brick are wire-cut end-cut, cut off by a Bechtel automatic end-cut machine, are dried in hacks and burned with wood in open-shed scoved kilns. The output is about one million per season.

John Kaar, Brownsville, uses the Erie blue clay in the manufacture of white tile, hollow blocks and end-cut wire-cut brick. The clay is used dry, and wheeled to a Bechtel disintegrator which breaks the lumps and throws out all stones. The product is fed to rolls, wich crush the clay to powder; it is then screened, and that which passes through the screen is fed to a pug-mill which in turn feeds a Kells machine. The brick are cut off by a Bechtel automatic end-cut machine, and are wheeled on Bechtel trucks to a carless dryer built by Bechtel Bros. The tile are piled on end on racks having four shelves, and when each rack is filled it is picked up by a gig and carried as a whole into the Bechted dryer. Here the racks are placed in a row, a covering of tar or felt paper is laid over them, and a blast of warm air blown on. When dry, the goods are burned in round down-draft Cornell kilns. Here Mr. Kaar uses an artificial blast from a fan in his drying house; this blast is used after the

water-smoking is finished. A three-inch tile main is led to the kilns and around the outside; opposite each fire hole is a small iron pipe leading under each grate and this forms the draft flues. The air having been previously warmed insures an even draft, a quicker fire, and a more uniform burn. The drafts usually found in brick kilns depends largely on the direction of the wind: where this artificial draft is used all other is sealed up so that the wind has practically no effect. This is one of the most thoroughly equipped yards in the Province, and Mr. Kaar has spared neither time nor money to make his yard first-class in every particular. The result is that his goods are also among the best seen in the Province.

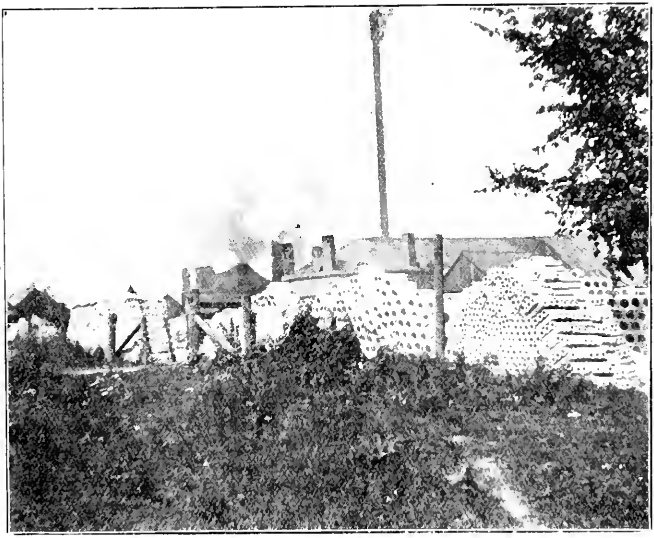

Fig. 50.—Beaverton Brick and Tile Co's yard, Beaverton. Note round down-draft kilns burning coal.

Ontario

The Beaverton Brick and Tile Company, Beaverton: This is a large yard making red and white stock brick and white tile, chiefly in sizes from two to ten inch. There is about two feet of Red-top clay which is used in the manufacture of red stock brick: beneath this is the usual Erie blue clay having the following composition:

	Per cent.
Silica	37.50
Alumina	10.31
Ferric oxide	3.59
Lime	22.56
Magnesia	2.61
Soda	1.11
Potash	2.34
Sulphur trioxide	.12
Loss by heat	19.60

The Red-top clay is mixed with sand for red brick, the next three feet of grayish blue clay is mixed with one-third its volume of sand, to make white stock brick; below this again is the typical blue Erie clay, which is made into tile of all sizes. All three classes of goods are of excellent quality The tile are burned in three round down-draft kilns using wood for the water-smoking, and soft coal for the remainder of the fire The red and white stock brick are burned for the most part in up-draft permanent walled kilns, the ends being scoved. The output of brick is about one and a half millions per seas n, and the output of tile is about seven hundred thousand, varying from two and one-half to ten inches in diameter. This company's output, especially its tile, is sent all over eastern Ontario, and even to Quebec.

William Gilmore, Whitby: Mr. Gilmore, who is eighty-seven years of age, has been operating this yard for the past fifty years He makes red brick, about one-half a million per year, and sixty to one hundred thousand white tile, varying in size from two and a half to nine inches in diameter. The brick are made from Red-top clay in a Martin machine using horse-power. They are hacked out in the ordinary way and are burned with wood in open-shed scoved kilns. The tile are made from the underlying Erie clay in a Kells machine using steam power. When dry, these are burned in an old fashioned up-draft kiln, having an open floor. The fire arches run from one side to the other beneath this open floor, so that the heat passes directly from the fire places up through the open floor into the tile and out at the top This makes a kiln which is very hard to control, and is the only one of its kind seen in the Province. The goods turned out by Mr. Gilmore are of excellent quality, and show that his long experience has made him a first-class brick-maker.

Parry Sound

D. Clark, Powassan, has a section of about twelve feet of Saugeen clay, quite free from stone, but containing the usual amount of interbanded sand. This sand dug in with the clay renders the whole quite mild, making it an excellently workable deposit. The clay is dug over in heaps and is allowed to slake during the winter with the frost and rain. It is then loaded into small dump-cars, which are hauled by cable and which dump automatically into a Monarch six brick machine The brick are then hacked out to dry, and after drying are wheeled to Case up-draft kilns, where they are burned with wood in the usual way. A very handy method is used here in setting the kiln, which avoids throwing up the brick. An elevator is placed at one end of the kiln and the barrows when wheeled on to it are raised to the required height, the brick being set directly from this. The elevator is movable, and as the kiln is built, it is gradually shifted so as to always be handy to the setting.

The burning is done in three of these up-draft kilns, and the brick produced are of an excellent red color. The output per season is from a million and a half to two million, all red brick. The analysis of this clay is given as No. 67, page 26 of this report.

V. Russel, Burk's Falls: Mr. Russel is successor to Mr. F. Kerr and is rebuilding the yard, adding a steam plant and additional drying space to the yard as formerly run by Mr. Kerr. He has from six to ten feet of Saugeen clay with its usual bands of sand, which render the whole quite mild and easily workable. The clay is dug as usual into a heap and allowed to slake in the weather. The advantage of this method of disintegrating, or pulverizing clay, is readily seen by exposing a piece of tough, hard clay to the weather, especially if it be frozen. It will be found that the stiff lump upon being exposed and frozen will crumble readily to an earthy powder. This is taken advantage of by brick-makers geenrally through the Province.

Mr. Russel wheels his clay from the heap to a Doig six-brick machine. The brick are then hacked out in the ordinary way, and when dry are hauled by truck-wagons

to open-shed scoved kilns, where they are burned with wood in the ordinary manner. Red brick only are made, but a good quality of these, the annual output being about 800,000 to a million.

L. H. Ware, Huntsville, has the usual section of six to ten feet of Saugeen clay somewhat fatter than that of Burk's Falls, but not so fat as that of Bracebridge. This is dug to a heap and allowed to slake as usual, when it is worked in a Martin machine using steam power. The brick are dried by the rack and pallet system, and are then burned in open-shed scoved kilns. The output for the season is about 700 000 red brick.

Peel

A. Norton, Bolton, manufactures red brick from the Red-top clay colored by red oxide. The brick are made in a Martin machine using horse power, are dried by the rack and pallet system, and are burned with wood in open shed kilns. Beneath the red clay is the usual supply of Erie blue clay, which is made into white tile with a Close machine. This machine is also run with horse power. Although the output is small, the goods are of excellent quality. Mr. Norton makes about one hundred and fifty thousand tile per season, varying in size from two and one half to eight inches They are burned with wood in a rectangular down draft kiln.

Brampton Pressed Brick Company, Brampton: This yard is managed by Mr Packham, who previously owned the yard himself, but it has been considerably enlarged and it is about to be moved to a new locality and further enlarged. The Medina red shale is used in the manufacture of red pressed brick. The shale is blasted and hauled by car to a pan mill, and the ground product is elevated to a set of screens placed at an angle of about forty degrees to the horizontal. The over size is returned to the pan mill to be re-ground, while that which passes through the screen is fed to a Boyd press. From the press the brick are wheeled directly to permanently-walled up-draft kilns, where they are burned in the ordinary way at first with wood, then by coal and wood, and finally by coal alone, the whole process lasting about two weeks. The output of pressed brick is about one million and one-half per season. On top of the shale is a coating of mixed clay and shale which is dug and used in the manufacture of red tile: about three hundred thousand of these are made per season and are burned in a round down-draft kiln. Mr. Packham is now moving his yard to the Credit Valley branch of the Canadian Pacific railway, where he intends to install two more presses, which will increase his output by two or three million per season. The shale used in this yard for the manufacture of red pressed brick analyzes as follows —

	Per cent.
Silica	56.52
Alumina	15.21
Ferric Oxide	5.82
Lime	6.86
Magnesium	2.82
Soda	.56
Potash	3.59
Sulphur trioxide	.29
Loss by ignition	8.79

As will be noticed by the above analysis, this shale is comparatively free from sulphur, so that the brick made from this shale do not show the efflorescence or "soda" so commonly seen on pressed brick, after they are built in the wall.

The Port Credit Brick Company, Port Credit: This yard, which is under the management of Mr Thos. Buchanan, is used in the manufacture of red pressed brick and is one of the largest and best run yards in Canada. It is situated on the shore of Lake Ontario about half way between Toronto and Hamilton. The brick are made

from a mixed shale, the upper part being reddish; below this the shale is yellowish brown, and lower down it is blue. The whole section is used in the manufacture of brick. The shale is blasted from the top to the bottom, and is hauled by car to two pan mills, the ground shale is elevated to screens, the oversize returning to be re-ground. The screened shale is then used in the manufacture of brick with a Berg press. The shale, when ground has the following composition:—

	Per cent.
Silica	56.46
Alumina	18.19
Ferric oxide	7.43
Lime	2.56
Magnesia	2.93
Soda	.63
Potash	3.54
Sulphur trioxide	.15
Loss by ignition	8.52

This analysis shows a high percentage of iron well fitted to produce the red color of the brick, together with a low percentage of lime, which, therefore, does not counteract the iron. The percentage of sulphur trioxide is very low, consequently the brick are practically free from the so-called "soda," usually found on red pressed brick.

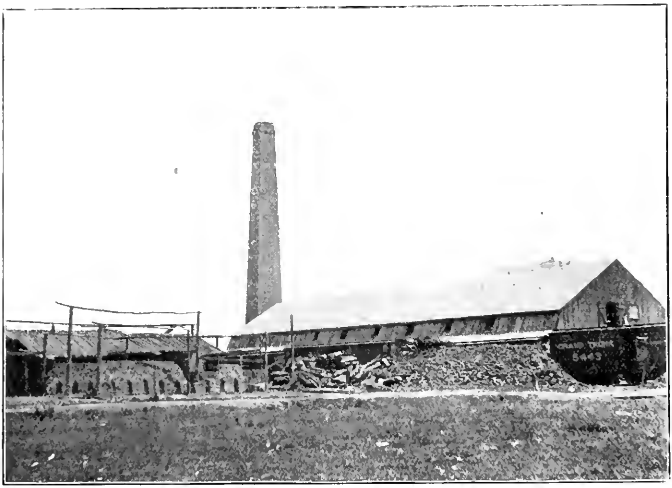

Fig. 51.—Port Credit Brick Coy's pressed brick plant, Port Credit, showing large continuous down-draft kiln.

The brick are wheeled from the machine directly to a Hoffman continuous kiln, consisting of eighteen chambers arranged continuously in an oval. The waste heat from one chamber passing through the adjoining chambers first dries off the brick, then, as the fire is led nearer it heats them up; finally the fire is led right into the new chamber, and so the process continues round the oval of eighteen chambers, so that when the fire is once kindled, it is never let out, but some chambers are being charged while others are burning, and still others are being discharged. Each chamber

is capable of holding about twenty thousand brick: thus the whole kiln will burn three hundred and eighty thousand in one round; and this can be done in sixteen days, once the fire is up. The firing is done from above through small hand holes about five inches square. A good sized handful of cracked coal is dropped down each hand-hole every twenty minutes, a large flue serving for all the chambers passes along the centre of the kiln with a small flue connecting it with each chamber, and in the outer end of each of these is a hand damper by which the fire can be regulated from one chamber to another.

This plant runs night and day, making thirty-eight thousand brick in twenty-three hours, or about eight million for the season. In addition to the Hoffman kiln a few permanent walled up-draft kilns are used to burn the surplus brick, but at the time of the writer's visit the foundations were dug for five new round down-draft Stewart kilns. Several other additions to the plant were being considered, among them being two more presses and an endless chain conveyor for the shale from the bank to the plant. This machinery, in fact, was already on the ground, electrical power was about to be acquired from Niagara, when the lighting, power, and electric rock drills were to be used. It will be thus seen that this plant is one of the finest and most thoroughly equipped in Canada.

Perth

Stratford Brick, Tile and Lumber Company, Stratford: This yard was formerly operated by Keller Bros., but has recently been rebuilt and enlarged and is now worked by the above named Company, although it is still managed by C. S. Keller. It has from two to four feet of Red-top clay, below which is the typical blue Erie clay. The Red-top clay only is used as yet, but the company expects to manufacture white brick and tile as well. The Red-top clay is dug and carted to a Kells machine. The Bechtel automatic end-cut cut-off is used. The brick are dried in open hacks and are burned in down-draft kilns, and occasionally in open-shed scoved kilns. The company has attempted the manufacture of dry pressed brick from this Red-top clay. It is dug as usual and left in the sun to dry, when it is hauled to a clay shed. Here it is put through a Bechtel disintegrator; the powdered clay is elevated to screens, and the over-size returned to be re-ground. This machine is excellently adapted to stony or lumpy clays, but will not pulverize the clay finely enough for pressed brick. A Berg press is used, and at the time of the writer's visit, a few pressed brick had been made, but the material was so coarse that the brick were mealy in grain, the particles not having fused together. It is quite likely, however, that when a machine is got that will pulverize the clay finely enough, a good pressed brick will result.

The clay used for the manufacture of these red pressed brick analyzes as follows:—(No. 1.)

	No. 1. Per cent.	No. 2. Per cent.
Silica	69.12	40.16
Alumina	14.03	13.76
Ferric oxide	4.81	5.58
Lime	1.91	15.71
Magnesia	1.10	3.78
Soda	1.53	.70
Potash	2.05	2.00
Sulphur trioxide	.10	.17
Loss by ignition	4.80	17.48

No. 2 is the Erie blue clay immediately below No. 1, and burns to white goods on account of the high percentage of lime. Since the writer's visit this blue clay has been made into dry pressed brick and specimens shown at the Clay Workers' Conven-

tion at Hamilton were very superior buff brick. This is the first case reported in Ontario of pressed brick being made from this Erie blue clay, although pressed brick have been made from very similar clay in the Province of Manitoba at Lac Du Bonnet[7] from re-assorted boulder clay whose composition is as follows:—

Silica	45.43
Alumina	10.67
Lime	10.50
Ferric oxide	4.78
Magnesia	6.03
Potash	3.04
Sulphur trioxide	.13
Loss by ignition	17.07

By comparing this clay with the Erie blue clay found in Ontario (see page 14), a close resemblance will be noted; both are assorted boulder clays, and it would appear that there is a good future for the manufacturer of buff-colored pressed brick from our Ontario blue clay. The brick made by Mr. Keller from this clay were of excellent quality, and speak much for his enterprise in this new departure of brick-making in Ontario.

For pulverizing this clay, Mr. Keller constructed a very simple machine which beats the clay to a fine powder. The machine can be built at a very low cost and has a very large capacity. He will no doubt be pleased to furnish information on inquiry.

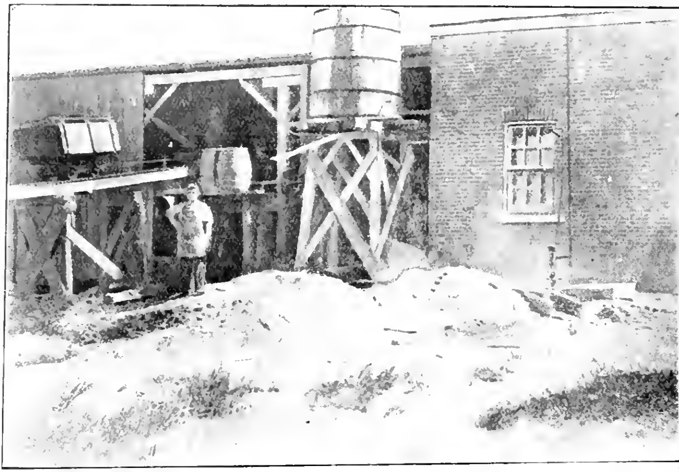

Fig. 52.—Part of Close Brick Co.'s plant, Stratford, showing a Baird clay-car bringing clay to the machine.

The Close Brick Company, Stratford: This yard has recently been established on the eastern limits of the city of Stratford. It manufactures red stock brick from the Red-top clay, beneath which is the stony blue clay which at present is not used. The clay is dug and hauled by car to a Monarch soft mud machine; the brick are trucked by the Bechtel system and are dried in a Bechtel Carless dryer. The

[7] Industrial Value of the Clays and Shales of Manitoba, by J. W. Wells, Geol. Surv. Can., 1905.

output is about fifteen thousand per day, or two million for the season. The brick are burned in up-draft scoved kilns, the water smoking is done with wood and the remainder by coal. Mr. Close, the manager of the yard, superintended the erection of the plant and has a very up-to-date one, producing a good red stock brick.

F. Entricken, Stratford: This yard is situated at the little lakes, three miles east of Stratford, and was formerly run by Mr. John Jarvis, now of Dorchester, one of the oldest brick-makers in the Province. These little lakes, three in number, represent pool-like basins in a former drainage channel which fed the Avon river, a small drain only remaining to mark the course of a former stream of considerable size. They are at present twenty-four to forty feet deep. It is supposed by the people of the district that they are connected by underground channels, but this cannot be the case, because the Grand Trunk Railway Company's pump house, situated on the shore of one of them, can lower the water in that lake without affecting the level of the other two. Moreover, the second lake level is twelve feet below that of the first. These lakes are the deep remnants of a former channel, which can be traced from above the first lake through the second and third and on over the country until it joins the present valley of the Avon river. At present the water is received from

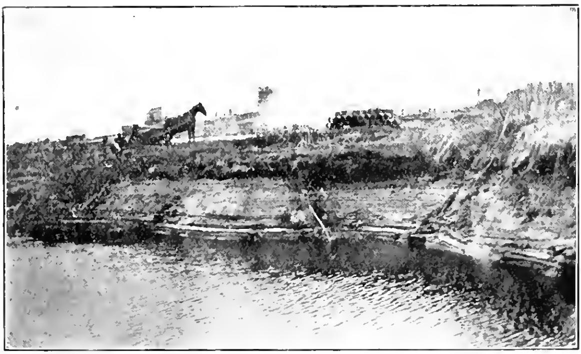

Fig. 53.—Laminated Erie clay beds at F. Entricken's yard, Stratford.

the surface drainage of the surrounding country. Mr. Entricken's yard is situated near the shore of one of the lakes, in fact his clay is dug from a pit which is below the level of the water in the lake, and a centrifugal pump is required to keep the pit dry. The clay, however, is excellent, it being very free from stones, and just sandy enough to be nicely tempered. Its analysis is as follows:—

	Per cent.
Silica	45.46
Alumina	9.73
Ferric oxide	3.83
Lime	15.80
Magnesia	5.06
Soda	.78
Potash	1.85
Sulphur trioxide	.12
Loss by ignition	17.37

The clay is dug and taken direct from the pit in cars to a Monarch soft-mud machine; the brick are dumped on pallets, dried by the rack and pallet system, and burned in three down-draft kilns with wood. The output for the season is about two million brick.

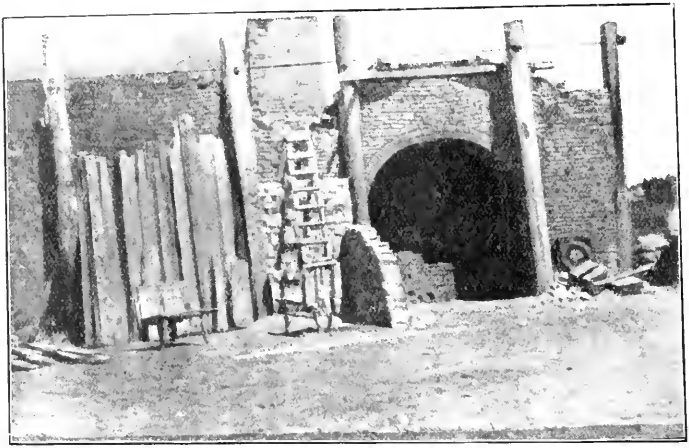

Fig. 54.—A double rectangular down-draft kiln at F. Entricken's yard, Stratford. No. 1 is being fired, while No. 2 is being discharged.

W. B. James, Mitchell, has from two to four feet of Red-top clay, underlaid by the Erie blue clay, which has been proven to be over twenty feet deep. He manufactures both red and white brick and tile, the chief output being red brick, of which he makes about one million per year, and in addition about eight kilns of tile running from two and one-half to ten inches in diameter.

For brick the clay is dug and carted to a pug mill, feeding a Quaker machine. The moulds are sanded by ground "bats," which are pulverized in a ball mill. The brick are dried by the rack and pallet system, and are burned by wood and coal in two round down-draft kilns. For tile a Kells machine is used.

W. H. Barnard, Monkton; J. Johnson, Monkton: These two yards, situated almost side by side, are working the same clay, namely, the Red-top clay, both making brick and tile. The brick are made by a Kells machine using the Bechtel automatic cut-off; they are then hacked out to dry and are burned in round down-draft kilns, using wood as fuel. The brick from these two yards were among the finest seen in the Province, especially on account of their rich, uniform, red color.

Peterborongh

Curtis Brothers, Peterborough, have about two feet of Red-top clay, which is underlaid by sandy Erie blue clay. Both are used in the manufacture of red and white brick, and tile and paving block. In this yard are two Iron Quaker machines and one Martin machine, all run by steam power. The clay is hauled direct from the pit in automatic dump-cars which feed Baird pug-mills, which in turn feed the brick machines mentioned above.

The brick are hacked out to dry and are burned in two square down-draft kilns, and in large open-shed scoved kilns. The output of this yard is about four million brick per year. The tile and hollow block are made on a Close machine, the hollow block being used for raised barns and stable floors. This is one of the largest yards in the Province and the goods manufactured are among the best.

There are two other yards in Peterborough, run by H. Butcher and T. J. Welsh, respectively. They are both small yards using horse power, and have an output of about five hundred thousand each per year.

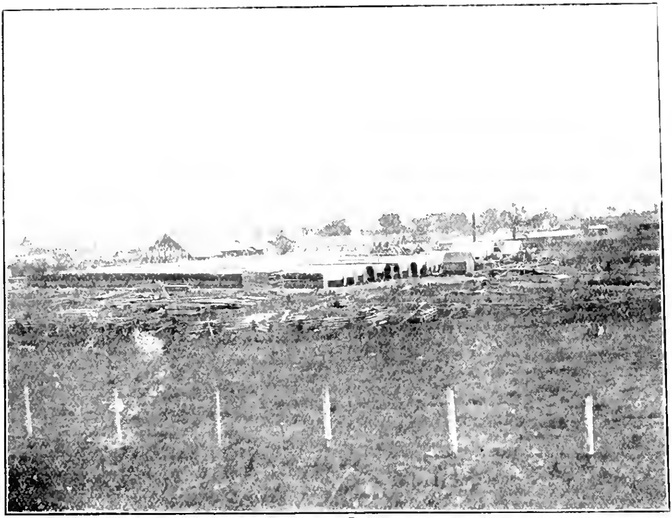

Fig. 55.—Curtis Bros' yard, Peterborough.

Prince Edward

D. Sullivan, Picton: There is just one brick yard operating in this county, and this is situated at Picton. There are from three to five feet of Red-top clay underlaid by Erie clay, having the following composition:—

	Per cent
Silica	34.48
Alumina	9.11
Ferric oxide	3.71
Lime	23.33
Magnesia	4.83
Soda	.90
Potash	1.76
Sulphur trioxide	.19
Loss by ignition	22.30

This analysis shows an extremely high percentage of lime and magnesia with a relatively high loss by ignition; the silica on the other hand, is very low, the inference being that this clay carries a very high percentage of ground-up limestones. The red

clay is used in the manufacture of red stock brick by means of a Martin machine and horse-power. The brick are hacked out to dry, and are burned with wood in open-shed scoved kilns. While the green brick are being set in the kilns, hard coal screenings are scattered through the heads to aid in the burning. The output of the season is only about four hundred thousand, as the demand is purely local

Renfrew

Wm. Baker, Arnprior, has from three to eight feet of very strong clay; this is underlaid by six feet of a mild, grayish clay, and below this is Leda blue clay to an unproved depth. The same section is thus exhibited as is shown in the other northeastern parts of the Province, for example, at Ottawa. A section of about fifteen feet is worked; the clay is hauled by horse and car to the foot of an incline, where it is elevated by a cable, and dumped to a pug-mill feeding a pair of rolls, from which it passes to a second pug feeding a new Quaker six-brick machine. In this way the strong top clay and the mild under clay are thoroughly mixed and an excellent product results. The brick are dumped on pallets and piled in racks on iron cars, which are run to a tunnel drier; the cars of dry brick are taken from the opposite end of the tunnels, to four round down-draft kilns, and occasionally to open-shed scoved kilns. The strong top clay is also used by itself in the manufacture of red tile; the clay is pugged, then passed through rolls to an English tile machine. An automatic cut-off is used, and the tile are stood on end on pallets placed in the same cars; they are also dried in the tunnel dryers and are burned in the down-draft kilns.

This is an excellent yard, and has an output of about twelve hundred thousand brick and tile per season, the power being steam and a sixty-horse compound engine. The clay here instead of being mixed with limestones, contains a corresponding number of hardheads or igneous boulders, carried by the glaciers from the igneous area to the northeast.

J. A. Thibadeau, Pembroke: Here we have another area of Saugeen clay, differing only from the others in being much more sandy. The section is dug and carted directly to a Martin Machine run by steam power. The brick are hacked out to dry, and are burned in open-shed scoved kilns with slabs. The brick are of a good color, but the clay is so sandy that it should be thoroughly pugged before going to the Martin machine. The output of this yard is about seven hundred thousand per year.

J. Johnson, Pembroke. This yard works on the same Saugeen clay as the last mentioned, the bank being in every way similar. It is operated in the same way except that horse power is used instead of steam. The output of this yard is only about four hundred thousand per season.

The Saugeen clay at Pembroke has the following composition:—

	Per cent.
Silica	62.30
Alumina	16.51
Ferric oxide	5.65
Lime	3.16
Magnesia	2.68
Soda	2.25
Potash	2.61
Sulphur trioxide	.40
Loss by ignition	3.60

Thomas Henderson, Renfrew, has two to three feet of Red-top clay, underlain by a grayish yellow clay which soon passes into Erie blue as usual. The Red-top clay is made into red stock brick, the under clay, which of itself will burn to white brick, is mixed with a coloring (of Mr. Henderson's own invention and for which he has

applied for a patent), and is burned also to a red brick. These are made with a Martin machine using electrical power; the tile are made in a Kells machine. The dried brick and tile are burned together in three round down-draft kilns. This yard has an output of about five hundred thousand brick, and about three hundred and fifty thousand tile per season, all being red. Mr. Henderson contemplates several improvements, among them being an artificial drier, and two more down-draft kilns.

F. Hilliard, Renfrew, has from two to three feet of Red-top clay lying on grayish yellow Erie clay, again underlaid by Erie blue clay, these layers representing the different stages of weathering. Mr. Hilliard uses only the Red-top clay in the manufacture of red stock brick and also red tile. The clay is carted to a Quaker machine moulding five brick at a time; these are hacked out in the ordinary way to dry, and are burned with wood in open-shed scoved kilns. For tile the clay is put through a pair of rolls feeding a Kells machine. The tile are burned with wood in two round down-draft kilns and an excellent quality of goods results. The output of bricks is about six hundred thousand per year, and of tile about three hundred thousand. This is a neat yard, and the goods are first class.

Russell

Merkley Brothers, Casselman: In this yard we find about four feet of a reddish iron-bearing sand underlaid by eight feet of Saugeen clay, this again being underlaid by white quicksand, and the whole by blue Leda clay. (See fig. 19.) The Saugeen clay is used with the sand in the manufacture of brick. The clay has the following composition:—

	Per cent.
Silica	59.34
Alumina	17.68
Ferric oxide	6.74
Lime	2.94
Magnesia	3.36
Soda	2.13
Potash	3.07
Sulphur trioxide	.47
Loss by ignition	4.60

The Saugeen clay, dug with the sand and hauled in cars to a pug-mill, is thoroughly mixed, the pug-mill feeding a Monarch six-brick machine. The brick are dumped on pallets, which are piled on cars, each of which carry four hundred and thirty brick. These are run into a Sheldon and Sheldon dryer capable of holding about sixty-four thousand brick. The day's output is about twenty thousand. These are dried in a little over forty-eight hours.

Up to the present year this yard ran about eight months for a season, and had an output of about four million brick, but this year the proprietors are trying a new and ingenious method to enable them to work through the winter months. A few large stringers, boom timbers for example, were laid on top of the ground parallel with the clay cliff, one coming very near the edge of the bank. Rough lumber was laid on these, and on top straw or other material; the lumber was allowed to project over the face of the cliff like a roof, and the face of the cliff was all boarded in so as to just leave working space on the face of the cliff. A door was made for the car track to enter the shed, the rest all being weather tight. An exhaust steam pipe was then run from the boiler into this shed and each night when the men quit work the shed was closed up and live steam blown into it until it was filled, this would prevent the clay freezing over night, and the men could start in the morning on fresh clay. As the bank is

dug back the long boom timbers support the roof and the work continues as in a big room. To prevent freezing while the brick are being made, the machine is placed between the drier and the boiler room; in this way the men are kept comfortable, and the clay is kept from freezing. The cars are run into the drier, of course, as before The burning is done with wood in scoved kilns

Fig. 56.—Merkley Bros' yard, Casselman, showing the scoved kilns and dryer.

From the above it will be seen that this is a modern yard; the brick turned out are of good quality and the proprietors are endeavouring to make still further improvements.

Baker Brothers, Casselman: This yard, which is situated beside Merkley Bros.' yard, is also an excellent one. The clay is exactly like that just described, and the process of working is the same, with this difference, that Baker Brothers run night and day and have two dryers, one for each shift. The output of this yard is therefore about six million brick per year which may be increased if operated in the winter. A very striking point about this yard is that nothing is allowed to go to waste, even the smoke from the power boilers is drawn by fan through a series of eight-inch iron pipes, over which the air for the dryer is drawn, the heat from the smoke being almost sufficient to heat the air for one dryer. The fan is run by a separate small steam engine, and this is automatically regulated from the large steam boiler. If the steam is down in the boiler, it opens a little guage on the small engine, admitting more steam and the engine runs faster thereby producing a stronger draft for the fires, so as to raise the steam. In proportion as the steam is raised, the supply to the smaller engine is lessened, and the latter slackens its speed. In this way the connection is entirely automatic. Again, all the steam used for the drier is completely condensed, and the hot water from it is used over and over again in the boilers.

A spur from the Canada Atlantic railway runs into both these yards, which.

although situated in a village, are two of the best yards in Ontario. This shows what can be done if brick-makers will only manufacture the right goods. Here we have two yards situated in a village, which, with the immediate surroundings, would not require three hundred thousand brick per year, nevertheless these yards turn out about ten million brick, and these are shipped all over the Province.

Simcoe

W. J. Norton, Alliston, had about two and one-half feet of Red-top clay overlying the grayish yellow and blue Erie clay. The Red-top clay has been all used for the manufacture of red brick; the grayish yellow clay is now being drawn upon, and this and the sand are mixed with a coloring of iron oxide to give the red color to the brick. The clay is dug and hauled by car to a Baird pug-mill which feeds a Martin machine. The brick are dumped on pallets and are dried by the "rack and pallet" system. The output is about 10,000 per day. The burning is done with coal in a square down-draft kiln, as well as in open-shed scoved kilns. The water-smoking is done by wood as usual. Mr. Norton also makes tile from this grayish yellow clay, but does not use any coloring as the color of tile does not signify. These tile range from two and one-half to ten inches in diameter and are of excellent quality. They are burned with wood and coal, in a rectangular down-draft Stewart kiln, and also in a simple rectangular down-draft kiln of Mr. Norton's own construction. (See fig. 37.)

W. Freek, Barrie, has about three feet of clean Red-top clay, below which is stony red clay passing gradually into stony Erie clay. The clean top clay only is used in the manufacture of stock brick. It is hauled in carts to a Martin machine, and the brick are dumped on pallets and dried by the rack and pallet system. They are burned in two square down-draft Stag kilns, and in one round down-draft Cornell kiln. The output is about one million per year. The brick made in this yard are of excellent quality, and the percentage of face brick got from each kiln is extremely high; as many as forty-nine thousand face brick have been taken from a kiln holding fifty-two thousand. This is got by tightening up the first three courses above the flues, and leaving the rest of the kiln more open. These three courses serve as a check to hold the heat throughout the kiln, when a good temperature has been reached. This tightening is done by piling three on three for three courses high from the top of the flues; these are taken out each time a kiln is burned. Mr. Freek claims to have had excellent results with this style of kiln bottom.

Thomas Bembrose, Beeton, has two and one-half feet of Red-top clay overlying yellowish gray Erie clay, the whole underlaid by Erie blue clay. The Red-top clay is used for brick and the balance for tile. The brick are made in a Quaker machine using horse power; they are hacked out to dry and are burned in a permanent up-draft kiln and an open-shed kiln. Mr. Bembrose burns almost entirely with coal, even to the water-smoking. The tile are made in a Kells machine, and are burned in a down-draft square kiln. Roofing tile is also made.

The output of the yard is about five hundred thousand brick and three hundred thousand tile.

Ridler Brick Company, Penetanguishene: In this yard there are about three feet of red sand underlaid by four feet of clay. These seven feet are dug together and thoroughly mixed in a pug-mill and burned to a red brick. The Baird pug-mill feeds a Martin machine operated in one yard; the brick are hacked out to dry in the ordinary way and are burned in open-shed scoved kilns.

This firm has erected a new plant alongside the old one, a Hercules machine made by Doig and Co., Toronto being used. The brick are dumped on pallets and are dried by the rack and pallet system. The dried brick are piled on truck wagons carrying from two hundred and fifty to three hundred and fifty brick to a load. They are

hauled by horse to the kiln ground and built up to the checker floor; a little straw is then spread over the checker, and on this inch boards are laid. The trucks are then hauled by horse on to this, and the kiln is continued to the top. This method is very handy and does away with all pitching up, as the men building the kiln take the brick off the truck as they want them; an empty truck is taken away each time a loaded one is left. (See fig. 58.) The output of this yard is about two million and one-half per season, and the grade is first class.

J. Blanchard, Penetanguishene, has from three to five feet of red clay and sand like that in Ridler Brothers' yard. The clay is carted to a Martin machine making five brick at a time; they are then dumped on pallets and are dried in open sheds. The burning is done with wood in open-shed scoved kilns. The output of this yard is about eight hundred thousand brick per season. The red sand in this clay adds much to the color of the brick, and they are, all in all, a very superior hard brick.

Chew and Pratt, Midland: This plant is situated on the side of a hill on the brow of which is about eight feet of rather sandy red clay. The clay and sand, however, are very fine-grained, so much so that in working a very close mud results, which can be only shifted with difficulty, and which will then lose its shape on wheeling out to the hack yard. The writer suggested the addition of coarse sand, some of which was got from the shore of Georgian Bay. This was pugged with the clay, when the latter was found to shift much more easily, to retain its shape in wheeling out, and to dry faster by not being so compact. The brick are made in a Martin machine, dumped on pallets and dried by the rack and pallet system. They are burned with wood in open-shed scoved kilns, and the output for the year is about one million.

Victoria

S. J. Fox, M.P.P., Lindsay: Mr. Fox, who is president of the Ontario Clay Workers' Association, has one of the neatest, handiest, and most thoroughly equipped yards in the Province. For years he has been spending much time and money on improvements, many of which were of an experimental nature. He now has an excellent yard. There are about two and one-half feet of Red-top clay, which is underlaid, as usual, by the Erie blue clay. The top clay is made into red brick, and the Erie clay into white stock brick and tile. For the tile, however, a little of the stronger Red-top clay is mixed with the Erie to improve the quality. The clay is gathered by a Quincy clay gatherer and carried to heaps beside the machines; the brick are made in a Martin machine and are dumped on pallets on an automatic turntable; the pallets are then piled on short-hinged barrows, and wheeled to a series of racks, where they are dried by the rack and pallet system. This rack yard is the finest seen in the Province. It is so constructed that there are no posts in the ground to heave with the frost, but the whole system is bolted together as one large square frame work, which rests on the ground. The covers are also hinged, so that the whole yard can be thrown open or closed up tight in four minutes, which is an advantage in case of thunderstorms. The dried brick are taken by horse trucks to open-shed kilns, the horse being taken right up on to the checker floor, with straw and inch lumber used to protect the brick. These are removed, board by board, as the kiln is built.

The brick are also burned in a series of six down-draft kilns, capable of holding two hundred and eighty thousand brick. These kilns are rectangular in shape, and are built in a series side by side, so that one flue wall serves for two kilns, the firing being done on the ends.

The mixed red and blue clay is made into tile, from two and one-half to eight inches in diameter, by a Close machine. The tile are all burned in the down-draft rectangular kilns and although mixed with the red clay, burn white. The burning is done entirely with wood, and the output of the yard is about one and one-half million brick, and about three hundred and fifty thousand tile per season. One of the

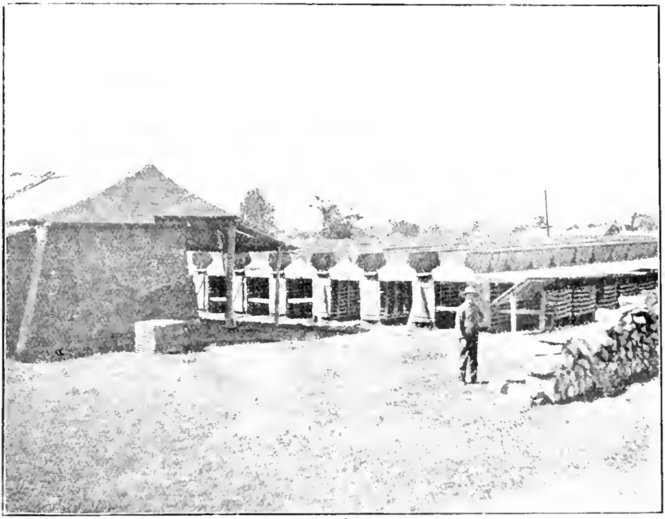

Fig. 57. - Rack and pallet yard of Mr. S. J. Fox, M P.P., Lindsay.

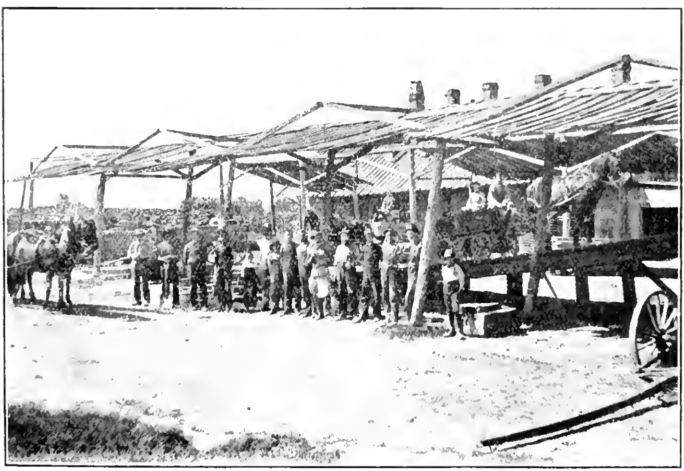

Fig. 58.—Mr. S. J. Fox, M.P.P.'s brick yard and workmen. Note method of trucking dried brick to kiln setting.

chief features of Mr. Fox's yard was the fine state of repair in which everything was kept. For example, his drying racks, described above, have been up for fourteen years and are as square and upright as ever; his kilns are the same, his machinery, engines, shafting, etc., have been running twenty years and are apparently in as good condition as ever. This is all the result of repairing every break at the time.

F. Curtin, Lindsay. In addition to Mr. Fox's yard there is another smaller yard located at Lindsay and run by Mr. F. Curtin. Both the Red-top and underlying Erie blue clay are used in the manufacture of brick. The clay is hauled by cart and put through a Baird pug-mill, which feeds an Iron Quaker machine. The brick are hacked out by the old system, and when dried are burned in open-shed scoved kilns with wood for fuel. Mr. Curtin has one round down-draft kiln, but does not use it; it was built for tile, and is at present idle. The output of this yard is about eight hundred thousand of both red and white brick per season. The output is small, but the quality of the brick very good.

Fig. 59.—A former "hack" yard replaced by a Bechtel Carless dryer: Brantford Brick Co's yard.

Waterloo

Bechtel Brothers, Waterloo, have operated their yard for many years and now possess a first-class brick plant; at the same time they have been gradually improving their machinery until now they have one of the largest brick manufacturing establishments in Canada. Among the machines patented by Mr. Byron E. Bechtel which are now on the market and in very general use throughout the Province are the following:—The Bechtel Disintegrator, for the removal of stones and pulverizing lumpy clay; a Lubricating Die for use on side-cut wire-cut brick machines; an Automatic Wire-cut Cut-off machine for either end, or side-cut brick (see fig. 29); a System of Trucks for handling brick or tile; an Automatic Wire-Cut Cut-off for hollow block and tile from two and one-half to eight inches in diameter; the Bechtel Carless Dryer.

In connection with the factory for making these machines Mr. Bechtel runs a brick yard where they can all be seen in operation. He works an Erie clay bank for the manufacture of white brick. The clay is gathered dry by a Quincy clay gatherer, an American machine for which Mr. Bechtel has the Canadian agency. With this machine one man and a team bring in sufficient clay for twenty thousand brick per

day. The clay is dumped to a Bechtel disintegrator, which pulverizes the lumps, and removes all stones. The powdered clay is then passed through rolls to a pug, where it is tempered and enters a Kells No. 1 machine. A lubricating side-cut die is used, and an automatic side-cut cut-off: this works admirably. Ninety brick are then piled on a pallet which is removed by the Bechtel trucking system to a Carless drier, the brick are taken directly from this to a series of rectangular down-draft kilns, up to which the railway comes. Mr. Bechtel's yard is thus one of the most thoroughly equipped in the Province, and one well worth visiting by those contemplating changes. The following analysis will serve for purposes of comparison by those who purpose working Erie clay beds, and it will be seen that this clay is about the average of other Erie clays in the Province:—

	Per cent.
Silica	44.30
Alumina	11.21
Ferric oxide	4.05
Lime	16.10
Magnesia	3.81
Soda	.93
Potash	2.09
Sulphur trioxide	.26
Loss by ignition	17.74

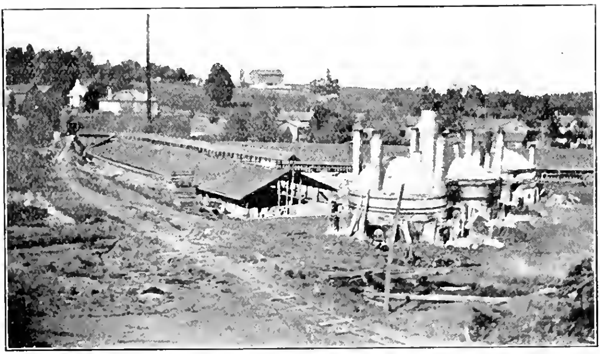

Fig. 60.—General view of Mr. F. Schaefer's brick yard, Breslau.

F. **Schaefer, Breslau,** manufactures white brick and tile from Erie blue clay. This is dug from the face of a clay bank in a hill. The clay is hauled in cars which dump to a hopper feeding a pug-mill: this in turn feeds a pair of large rolls; the powdered clay is then further pugged before being put through a Kells No. 1 brick machine. The result is a very thoroughly mixed clay, and a very smooth uniform brick. The clay is blasted out of the bank with black powder, in large masses, and two men bring in all the clay for twenty thousand brick per day. The brick are dried by the Bechtel Carless Dryer, and are burned in a series of four round down-draft kilns. The greater part of the plant is new, and is strictly up to date. The output is about two million brick per year, and ten kilns or more of white tile from three to ten inches in diameter. This is a very complete yard as shown in the accompanying cut, fig. 60.

W. Collard and Son, Waterloo, manufacturers of white wire-cut brick, use Erie clay with the same composition as that in Bechtel Bros' yard, whose analysis is given above. A fine new plant has been installed in this yard, which is now turning out about two and one-half million per year. The clay is scraped on to a platform, and dumped through a hopper to a clay car, which carries it to the clay shed. It is then worked dry in a Bechtel disintegrator, the product passing to a Baird pug-mill, and a Kells No. 1 brick machine. The Bechtel automatic end-cut wire-cut machine is used, and the brick are then piled on to steel cars, which are run to a Sheldon and Sheldon dryer. The dried bricks are taken from the opposite end of the tunnels to the kiln yard, where they are burned with coal after water-smoking with wood. This is also one of the most complete yards in the Province.

Michael Ott, Berlin, manufactures white wire-cut brick from the Erie blue clay which in this yard is very sandy. The clay is gathered with a wheel scraper, after being sun dried; it is then dumped into a Bechtel disintegrator. The product passes through rolls to a Kells No. 1 brick machine. The Bechtel automatic end-cut cut-off is used and Bechtel trucks to an open-air drying shed. At the time of the writer's visit Mr. Ott was contemplating the installation of an artificial dryer, which would largely increase his present output of one and one-half million per year. The burning is done with coal, after water-smoking with wood, in four circular down-draft kilns.

H. D. Dalmer, Conestogo: This yard is situated at a bend in the Conestogo river, on a flat which appears to have been formerly a flood plain of this river. Here is a first-class accumulation of Red-top clay), which is remarkably free from stones, and uniform in character. It is thicker here than in most parts of the Province, being an accumulation from the surrounding country. The analysis is as fol lows:—

	Per cent.
Silica	65.06
Alumina	14.15
Ferric oxide	4.67
Lime	2.36
Magnesia	2.18
Soda	1.48
Potash	2.66
Sulphur trioxide	.32
Loss by ignition	6.76

Mr. Dalmer manufactures red brick and tile only. About one and one-half million brick, and about seven hundred thousand tile per season is his output. His clay is carted to rolls feeding a Kells machine. An automatic end-cut cut-off is used, and the Bechtel trucking system to open-air dryers. The brick are burned in down-draft kilns, and also in open-shed scoved kilns using wood for fuel. Mr. Dalmer also operates a white brick yard at Elmira, where he makes one and a half million white wire-cut brick. These are burned in a square down-draft Stewart kiln, using wood for fuel. Taking into account his two yards, Mr. Dalmer has one of the largest outputs of brick and tile in the Province.

Welland

D. D. Hooker, Welland, has about three feet of Red-top clay, underlaid by Erie blue clay. The Red-top clay is somewhat stony. The pebbles are removed by passing the clay through a Bechtel disintegrator; the product from this passes by carriers to a pug-mill, which feeds a Martin machine. The brick are dumped on pallets, and are dried by the rack and pallet system; the burning is done in open-shed scoved kilns, using wood for fuel. Mr. Hooker also makes red tile and hollow block; the pugged clay for which is used in a Kells No. 1 machine. The tile and hollow block are dried

in open sheds, and burned with wood in a round down-draft kiln. The yard is situated on the bank of the Welland canal, which at the time of the writer's visit was being dredged, and the dredge brought up Erie blue clay, showing that this clay must be at least twenty feet deep at this point.

T. M. Ryan and Company, Niagara Falls, have about three feet of Red-top clay overlying the Erie blue clay as usual. The firm uses both kinds in the manufacture of brick, the Red-top clay being made up into stock brick with a Martin machine; about eight hundred thousand of these brick are made per season. The drying is done by the rack and pallet system, and the burning in two large up-draft permanent walled kilns. The water-smoking is done with wood, and the remainder of the burning with coal. The underlying Erie clay is made up into wire-cut brick; the sun dried clay is pulverized is a Bechtel disintegrator, and the clay is then passed through an American machine turning out end-cut wire-cut brick. This part of the plant is not much used at present, Mr. Ryan giving most of his attention to red stock brick.

Wellington

Bell Brothers; R. Holton; Smith & Colfax, Drew: These three yards situated side by side, are located about one mile and one-half from Drew. The clay is a sandy, mild, blue Erie clay, making white brick. On the surface is a foot to a foot and one-half of Red-top clay, somewhat stronger than the underlying Erie clay. This Red-top clay is made into tile, which are formed in Kells machines, and are burned in down-draft kilns using wood for fuel. Bell Bros. use a round down-draft Cornell kiln, while Smith and Colfax have a rectangular down-draft kiln, which they use for tile. In the manufacture of brick all three use Martin machines. The brick are hacked out to dry, and are burned with wood in open-shed scoved kilns. Each of the yards has an output of about one million and a half brick per year.

All three are very progressive yards, and are making brick for shipment, as the local demand is extremely small.

Wentworth

The Fruitland Brick Company, Fruitland: This yard is situated on the line of the Hamilton, Grimsby and Beamsville electric railway. Red brick are made from Medina red shale, which underlies this part of the country, and has the following composition:—

	Per cent.
Silica	56.90
Alumina	17.40
Ferric oxide	6.64
Lime	3.84
Magnesia	2.65
Soda	.53
Potash	3.51
Sulphur trioxide	.31
Loss by ignition	8.78

The shale is uncovered on the surface and allowed to slake: it is then collected in a scraper, and dumped to a pan-mill, where it is ground; the pulverized shale is then elevated to a hopper which feeds a Baird pug-mill that in turn delivers to a another side-cut machine very similar to the Freeze wire-cut machine, which is also used; it has an automatic side-cut cut-off, so that both classes of brick are made in this yard. The brick from both machines are piled on pallets, and trucked by the Bechtel system to open sheds, and also to a Bechtel Carless dryer. The dried brick are burned in permanent-walled up-draft kilns, and also in one round down-draft

kiln. The water-smoking is done with coke, and the remainder of the burning with soft coal. Here we have an example of the stiff mud process of brick making used on a shale, which is better suited to the manufacture of dry pressed brick.

Hamilton Brick Yards: In the western part of the city of Hamilton there are eleven brick yards, all apparently in a very flourishing condition. They are all situated on a high bench which represents a former stretch of Dundas bay. On the surface is from five to eight feet of good red-burning clay. This is underlaid by great beds of gravel which form the margins of the old beach, probably acting as a dam across the Dundas river, behind which the clay settled. At any rate this bank is part of a long raised beach, which extends from the foot of the mountain across the western part of the city to and beyond what is known as the High Level Bridge, then eastward as a bank along the Grand Trunk Railway between Hamilton and Toronto as far as Burlington. The outline of this beach can be traced very clearly; all the lower part of the beach is composed of fine gravel, cemented to a conglomerate. Above and behind this to the west we find the clay which is used in these brick yards. Below the gravel is the usual Erie blue clay. (See fig. 21.)

On this clay bank eleven yards are manufacturing brick, namely,

The Aberdeen Brick Company; John Hancock; Edward New; Crawford Brothers; M. Ollman; George Mills; Sam Cheesman; Frid Brothers; Thomas Landers; George Webb; George Frid.

All these yards are manufacturing red stock brick and the method in almost all of them is the same. A description of one will suffice for all.

The Aberdeen Brick Company was originally formed by the International Harvester or Deering company to ensure a supply of brick for the construction of their large plant, and finding that there was demand for all the brick that could be turned out in the city of Hamilton, they decided to continue operating the plant. Mr. George Beven is manager. This is the largest brick works in the city of Hamilton, the plant itself covering about two acres. Red brick are made by both the soft-mud and stiff-mud process. The clay is dug, hauled by automatic dump car, and dumped into a disintegrator, feeding a Freeze wire-cut machine; and an automatic side-cut cut-off is used. The brick are then piled on cars and run to a tunnel dryer of the Sheldon & Sheldon type. Some of the brick are dried in a Bechtel open-air dryer. In the soft-mud process, the powdered clay is thoroughly tempered in the pug of a Hercules machine. The brick are dumped on pallets and are dried by the rack and pallet system. The burning of both classes of brick is done in a series of eleven up-draft kilns, some of which are permanent-walled, while others are open-shed scoved kilns. The water-smoking is done with coke, and the balance of the burning with soft coal. This plant runs winter and summer, the clay being protected in winter by a coating of straw and manure spread over the surface. The output for the year is about two and one-half million wire-cut brick, and about eighteen hundred thousand stock brick, making a total output of about four and one-half million.

The remaining ten yards, whose proprietors are enumerated in the list above, are so near alike that it is not necessary to describe each one individually. The method of manufacture is practically the same in all of them, and the output is roughly the same. They all have from five to eight feet of the same strong red clay as is worked in the Aberdeen yard. The clay is carted or hauled in cars and dumped to a pug-mill; the pugged clay is fed to a Martin machine, and in a few cases to a Quaker machine; the brick are then dumped on pallets and dried in a rack and pallet yard. The burning in all these yards is done in up-draft permanent-walled kilns or occasionally in scoved kilns; the water-smoking is done with coke or wood, and the balance of the burning with soft coal. These yards have an output of about one and one-half million, each, per season. Mr. John Hancock's yard is a little larger than the others, as he works two Martin machines and has an output of two and a half million or more per season. Many o these yards are run by electric power, which is got

from Decew Falls: Mr. Hancock, for example, operates his plant, which includes cars hauled by cable, two pug-mills, and two Martin machines, quite easily by a thirty horse-power electric motor. Even the large Aberdeen works, which contain a great deal of machinery is run by an electric motor. The chief advantage of this is that the plant can be started or stopped in a moment, and when once started the motive power requires practically no attention for the balance of the day. The brick made by all these firms are excellent red stock brick, so much alike in color and quality, that they are handled by one contractor, who contracts the brick for all the buildings in the city using the Hamilton product.

York

In Toronto and its suburbs, including Toronto Junction, Carlton West, Humber Bay and Mimico are many brick yards; in all some thirty, engaged entirely in the manufacture of brick, together with several yards making sewer pipe, paving brick and drain tile, as well as pottery. The output of these thirty yards is something over a hundred million brick per season, and the majority of these are stock brick, only about twenty-two million pressed brick being included. There is but one yard engaged in the manufacture of wire-cut brick, but this is largely due to the nature of the clay used.

The clay found in most of these yards represents an accumulation of re-sorted glacial clay. The accumulation seems to have taken place at some inter-glacial period, because glacial clay is found both above and below it. The clays of the Toronto district have been described by Dr. Coleman in the report of the Bureau of Mines for 1904. The clay is very mild and sandy, the upper part of it burning to a red brick, very dark red in color. Beneath this red-burning clay is a gray colored clay, which is also quite mild from the large percentage of sand which it carries, and this when burned yields a white brick, or as they are locally called, gray brick. Both these clays, while containing a great deal of sand, are remarkably free from boulders and pebbles. This clay is so mild that it is used in all cases in the manufacture of soft mud brick, and it is doubtful whether it is strong enough to be used in the manufacture of wire-cut brick.

The above mentioned yards fall into several groups, as certain localities have been chosen by the brick makers, and several yards are found side by side in such places. These yards will therefore be taken up in groups, as the method of working is practically the same in each group.

Wakefield Brothers, C. Mason, J. W. Lainson, James Lochrie, Edward Wakefeld, J. Brown, Thomas Norton; Carlton West: All these yards are situated a little west of Toronto Junction. The post-office, however, for all of them is Carlton West. The general method of manufacture is the same in all, so that a general description of this group will suffice. The clay is dug separately, that is, the red by itself, and the underlying white-burning clay by itself. As a rule these clays are dug to heaps and allowed to slake, when they are taken by cart or wheel-barrow to the machine. In most cases the Martin machine is used, although Mr. Lainson and Mr. Lochrie use the Hercules machine. The brick in most cases are hacked out in the ordinary way to dry. Mr. Lainson, however, uses the rack and pallet system. The brick in all cases are burned together, that is, both red and white, in ordinary open-shed scoved kilns using wood for fuel. The output of each of these yards varies from one million to three million. Mr. Lochrie has the largest output. The brick made here are of excellent quality, the red brick especially having a splendid color.

Hinde Brothers, Lainson and Son, William Bushell, Titley and Frost, Smith and Crang, Brown Brothers; Carlton West: These six yards are situated in another group close to Toronto Junction station on the Grand Trunk Railway. They are smaller yards, and all have about the same method of manufacture. They each have an output of about one million brick per year, part of which are white and part red.

The clay is dug to a heap and allowed to slake, when it is worked by the Martin machine in the usual way. The brick are dried by the ordinary hacking system, and are burned with wood in open-shed scoved kilns.

Joseph Russell, Queen St. East, Toronto, operates one of the largest yards in Canada. It is entirely given up to the manufacture of stock brick, both red and white Two machines operate all the year round, and five machines for seven months during the year. The output of the yard for a season is about ten million brick. The clay is dug directly from the bank and carted to one of the machines, all of which are of the Martin type. In five of the plants the drying is done by the rack and pallet system or by the hacking system. In the other more permanent plants the brick are dried in the Sheldon & Sheldon dryer and the burning is done in kilns of various kinds, some of which are the ordinary scoved kilns, some case kilns, some rectangular down-

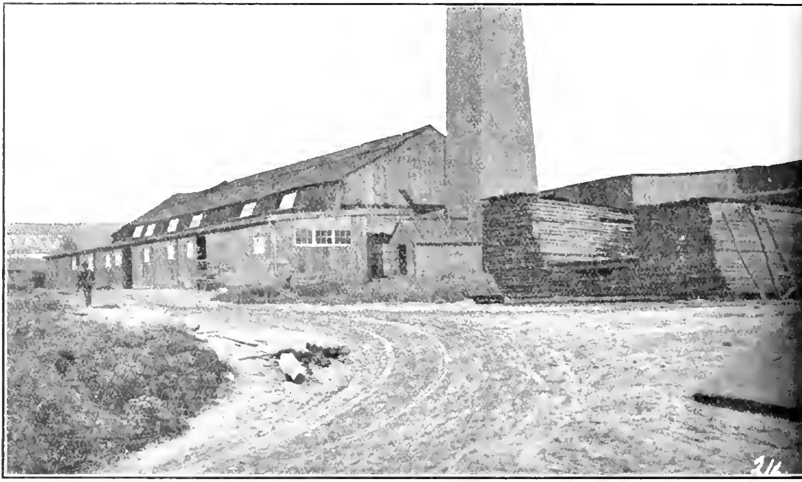

Fig. 61. Large continuous down-draft kiln in Jos. Russell's yard, Queen street east, Toronto.

drafts, and one large, oval-shaped continuous kiln composed of sixteen chambers, each of which will hold twenty thousand brick: the whole kiln, therefore, being capable of holding 320,000 brick, a complete round of the burning being made in sixteen days. A full description of this style of kiln was given above in the description of the Port Credit brick works. The continuous kiln is burned by coal, while the other kilns used at Mr. Russell's yard are burned with wood. Both red and white brick are made, but the majority are white.

John Price, W. Morley, J. Ashbridge, Bell Brothers, Morley and Ashbridge, T. Sawden, David Wagstaff; Greenwood Avenue, Toronto: These yards form a group on Greenwood Avenue south of the Grand Trunk railway track. The clay worked by them is like that worked by Mr. Russell, mild, sandy clay, the upper part of which burns red, while the lower part burns white or gray. These yards have practically the same method of manufacture, so that a separate description for each is not necessary. The largest yards are operated by John Price and Bell Brothers,

so that a description of one of these will be given. The clay is dug and carted directly to Martin machines, of which Mr. Price has two. The brick are dried by the Sheldon & Sheldon drier, after which they are burned in open-shed scoved kilns with wood. Both red and white brick are made of an excellent quality. The output of Mr. Price's yard is over seven million per season. The output of Bell Bros.' yard is nearly four million, while the remaining yards make from a million and a quarter to two million per season.

J. Logan, A. H. Wagstaff, J. Price, J. E. Webb; Greenwood Avenue, Toronto: These four yards are on Greenwood Avenue, north of the Grand Trunk railway tracks, and are working a very different clay from those south of the railway. They are situated on the top of the banks of a ravine about a hundred feet deep. The clay is dug in the bottom of the ravine from the face of a steep bank on either side.

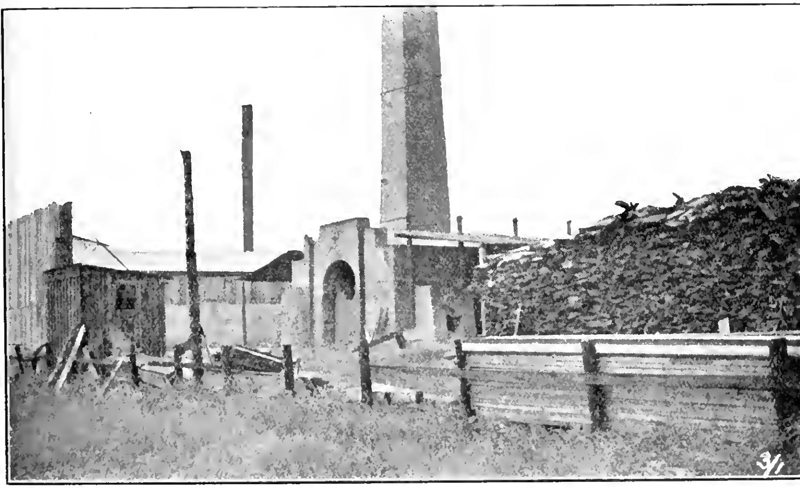

Fig. 62.—A. H. Wagstaff's yard, Greenwood Ave., Toronto, showing rectangular down-draft kiln and Sheldon dryer.

Examining a section of this clay bank, we find that the upper twelve to twenty feet of clay is very like our typical boulder clay throughout the Province, in that it contains many boulders and pebbles of glacial origin. Immediately beneath this clay, however, there is thirty to eighty feet of a stiff blue clay free from stones of all sorts, but containing many small bands of quicksand. This blue clay is exceptionally uniform in character, and is very compact and laminated like a shale or limestone. Immediately below it again we find the stony clay of glacial age, thereby indicating that this intermediate band was laid down in comparatively still water at some inter-glacial period. This blue clay, unlike the blue Erie clay found throughout the Province, burns to a rich red brick of excellent color and strength. In this respect this clay acts like the Leda clay found in the eastern part of the Province, but of course bears no relation to it. This stiff, blue clay is blasted loose by dynamite. It is then loaded into cars and hauled by cable up on to the level ground to the brick plant, which is situated above the ravine. Here the cars dump to a pug-mill, after passing through a pair of rolls

which serve to break up the stiff layered lumps as they blast out with the dynamite. From the pug-mill the clay feeds to a Martin machine, after which the brick are dumped on pallets which are piled on steel cars and are dried by the Sheldon & Sheldon drying tunnels. They are then burned in scoved kilns or in up-draft case kilns, and in some cases in rectangular down-draft kilns, the fuel being wood in all cases.

Mr. Logan makes about three million bricks per year, Mr. Price and Mr. Wagstaff each making a similar amount, while Mr. Webb, who does not use the Sheldon & Sheldon dryer (see fig. 32), does not make quite two million brick per year. All four yards make very excellent hard red brick. The analysis of this inter-glacial clay is given amongst Lacustrine clays above, No. 70, page 8, of this Report.

John Pears, Davisville: This yard is situated at Davisville and is reached by Yonge street. This clay is unlike any of those mentioned before. It is a local collection, variable in nature. In some places it is very sandy and mild, while in other places it is quite strong. Both red-burning and gray-burning clay are found here, red occurring on top of the gray. This is the order as we have seen throughout the whole of the Province. The two classes of clay are dug separately in the fall, and are allowed to freeze and disintegrate during the winter. The clay is then dug and worked in a Martin machine, one machine being kept for white brick and one for red. The brick are then dumped on pallets, forty of which are piled in a rack on a four-wheeled truck which is hauled by a horse to the rack-yard, where the brick are placed in the racks and allowed to dry. In this way 200 brick are taken at one time by one horse and a boy. It requires in addition one man to load the trucks and one man to unload, but as this yard makes twenty-six thousand brick per day, two men with one boy and a horse handle the total output from the machine to the racks, which appears to be about the most economic method yet seen for handling brick in an open yard. The brick when dried are burned in open-shed scoved kilns with wood for fuel. The output of both red and white brick is something over four million per year.

Butwell Brothers, G. Armstrong; Humber Bay, Toronto: These yards are situated at the Humber and work a very mild, sandy clay much like that found at Mr. Russell's yard, or at the yards on Greenwood Avenue. We have here a mild, sandy clay, the upper part of which burns to red brick, while the lower gray colored clay burns to white or gray brick. Both these clays are dug in separate heaps and allowed to slake. They are then wheeled to Martin machines, dried in an open hack yard, and are burned with wood in the ordinary way in open-shed scoved kilns. Butwell Bros. have two yards having an output of something over two million per year. Mr. Armstrong has one machine with an annual output of about 800 thousand.

The Toronto Fire Brick Company, Mimico: This plant was built some years ago for the manufacture of fire brick, when it was thought that by mixing our Ontario clays with certain imported clays a good grade of fire brick could be made. The method, while successful enough, could not be carried on economically, and the plant was closed down. It has been lately acquired by other parties who have formed the Toronto Fire Brick Company, preserving the old name, but engaging in the manufacture of red pressed brick only. The plant was rebuilt and has only recently been started, the first kiln of brick having just been opened before the writer's visit. The brick were found to be of excellent quality, both as regards color and strength. The raw material is the Hudson River shale, which is blasted, after being steam drilled, and hauled by car and cable to a panmill. From this the powdered clay is elevated to a hopper which feeds the dry presses, three of which are used in this plant. The brick are taken directly from the machine to a series of rectangular down-draft kilns, each of which will hold a quarter of a million brick. See fig. 63. When this plant is running perfectly the output will be about a million per month. The addition of this plant to those previously existing will materially increase the output of pressed brick in Ontario. The shale used has the composition of No. 73, page 8, of this report, analyses of shales

The Don Valley Pressed Brick Company, Toronto: This is one of the oldest and certainly one of the best brick plants in Canada. It is situated in the Don valley, about half a mile northeast of Rosedale. From its earliest start as an ordinary stock brick yard, it has been gradually improved until at present everything in the brick and block line made from clay or shale is manufactured by this company, including pressed brick, both buff and red, the enamelled brick in all colors now so popular as inside linings of buildings, wire-cut brick for inside walls, stock brick both red and white, terra cotta lumber, and fire-proofing of every description and of every shape required in steel structures. Hollow tile and block are also made for flues or drainage purposes.

This company has exposed a section about 125 feet high. Seventy-five feet at the base is shale, and borings show this to extend for four hundred feet deeper. Resting immediately on this shale is about four feet of very strong stony Erie clay. Above

Fig. 63.—Part of a series of rectangular down-draft kilns used by Toronto Fire Brick Co., Mimico.

this are fifteen feet of red sand showing distinct lamination and much stained by iron oxides. Above this sand is three feet of blue clay followed by two feet of very clean rounded, water-worn sand, above which there is eight to ten feet of clean blue clay which burns to red brick. This clay appears in every way to be contemporaneous with that found at Webb's, Price's and the other yards on Greenwood Avenue north of the railway, being quite free from stones and boulders, and exhibiting the thin bands of quicksand. It appears to be at about the same altitude as the Greenwood Avenue clay, and like it, burns to red brick. Above this blue clay is twenty to sixty feet of glacial mixed clay and loam, which is found so widely scattered over the Province.

The finding of this thick layer of blue clay, underlaid and also overlaid by the typical glacial clay carrying boulders and pebbles, shows it to be an inter-glacial accumulation laid down in comparatively still water. The section of shales, sand and clays found at the Don Valley Brick Works is the most interesting one seen in the Province, as all the relations are so well exposed.

All the clays mentioned above are worked by the company into one class or other of clay product. The top boulder clay and loam is worked by itself in a wire-cut plant for the manufacture of inside brick. Of this class of goods the company made eight million and a half last year. This clay is also made up into porous brick, or what is known as terra-cotta lumber. These are large hollow blocks of any desired shape, made so that nails, screws, etc., may be driven into them. The demand for these is becoming quite great, and 600 thousand blocks of various shapes were made by this company last year. They are usually one foot square and two or three or more inches in thickness, as required.

The red-burning clay, as well as the gray-burning clay, is made into stock brick. This clay is dug and sent in cars from the upper part of the hill to the valley where the cars are dumped on automatic tipples, to a large granulator, or pug-mill. From this the clay feeds to conical rolls. The empty car is hauled to the top of the hill by the descending loaded car, a brake being all that is necessary to govern the speed. The brick are made in a Hercules machine, are dried by a system of Sheldon & Sheldon dryers, and are burned in a continuous kiln.

The wire-cut brick, which are made from the gray, or upper Erie clay, which is dug by steam shovel, are made at the rate of 80 thousand per day in a Chambers automatic wire-cut machine. The bricks are piled on cars and dried in a Sheldon & Sheldon dryer, and are burned, like the stock-brick, in a continuous down-draft kiln. In the manufacture of fire-proofing, the Erie clay, after being thoroughly ground to crush any pebbles, etc., which it may contain, is mixed with a certain percentage of sawdust. It is then forced through a tile machine with a die of the required size. The blocks are piled on cars and are dried in a Sheldon & Sheldon dryer, after which they are burned in a down-draft kiln, when the sawdust burns out, leaving the blocks quite porous. This has two advantages: in the first place, the blocks are left so porous that they are light and therefore fit for ceilings, arches, walls, etc., with the minimum of weight; and again, being porous, nails, screws, etc., can be driven into them about as readily as into lumber.

The shales underlying the clay are worked into pressed brick; both buff and red colored. The shale is blasted out as usual. It is drawn up by car and cable and dumped to a panmill, where it is thoroughly ground. It is then fed to three presses. The bricks are taken directly from this to a series of six rectangular down-draft kilns. The output of red pressed brick for last year was three and a half million, and of buff pressed brick about two million. The burning in all these kilns is done with coal. In addition to the six down-draft kilns, this company has two large continuous down-draft kilns, one of which holds 400 thousand brick, the other one and a quarter million brick. These are charged and burned in the usual way and need no description here.

For the manufacture of enamelled brick this company has the only plant at present in the Province. The pressed brick, whether red or buff as required, are dipped on face in a glaze, after which they are dried. This dipping is repeated several times, and when a sufficient coat is deposited the brick are burned in a special kiln. This is a muffle kiln heated by coal, but the brick are not exposed to direct heat. Glazed brick of all colors are now made by this company. The output for last year of all classes of enamelled brick was 120 thousand.

Paving Brick

The Ontario Paving Brick Company, Limited, Toronto Junction: Having now dealt with the manufacture of building brick in yards representing all parts of the Province, we will turn our attention to some of the other products manufactured from our Ontario clays. That most nearly associated with brick is paving brick, whose chief quality is hardness and resistance to wear. Its manufacture is made possible

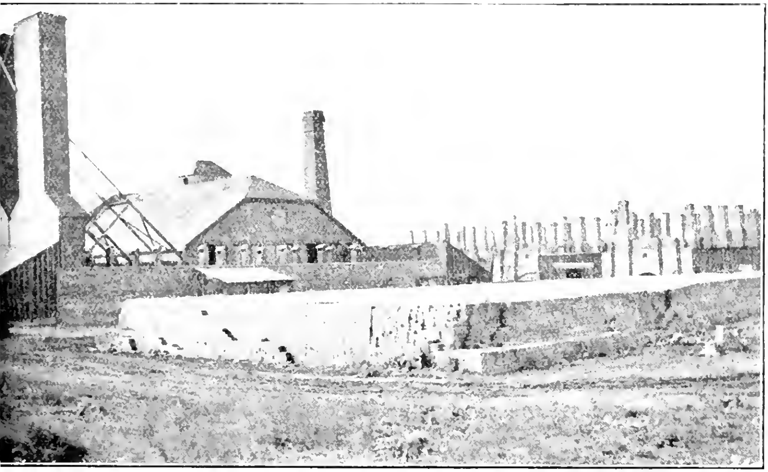

Fig. 64.—General view Ontario Paving Brick Company's plant, showing stock of paving brick and Sheldon dryer.

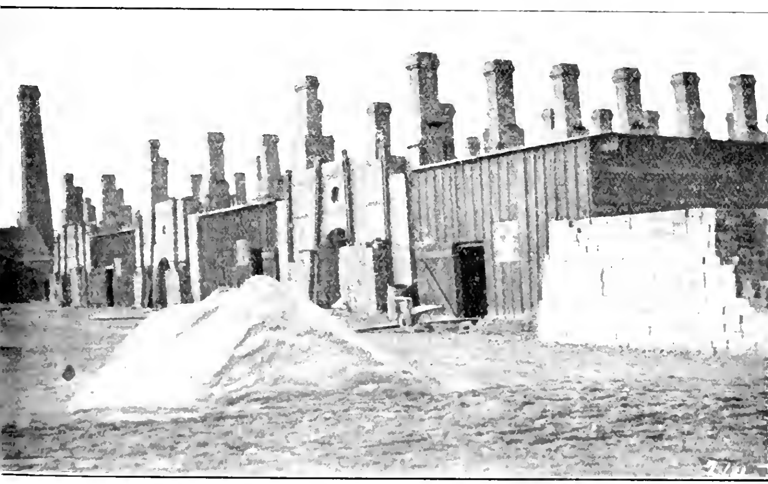

Fig. 65.—Rectangular down-draft kilns for burning paving brick ; Ontario Paving Brick Company.

by finding a clay which, in addition to burning hard, can be vitrified by a little higher temperature without causing the whole mass to become viscous and lose its shape. There is only one such plant in the Province of Ontario. Vitrified paving brick differ from building brick in shape and hardness. They are made 4x4x9 inches, with rounded edges so as to prevent chipping and when laid in a pavement outlast any other material for paving. The chief objection, however, to them is that they are noisy. The size of brick mentioned above is somewhat greater than usual. The increase in size is for the purpose of making the brick less noisy by a reduction in the number of joints per square yard of pavement, for it is the rattle of the joints which causes the noise.

This company has a very successful plant situated at Toronto Junction. They are engaged in the manufacture of vitrified paving brick, sidewalk brick, sewer brick, also red and gray building brick. The raw material used is a mixture of Hudson River shale with the Red-top clay, about one-seventh of the latter being added. The shale is hauled to a store shed during the winter and allowed to dry. It is then ground in two pan mills, the ground material being elevated to a hopper from which it is fed to a large pug-mill. This in turn feeds an auger stiff-mud machine, which turns out the bricks like an ordinary wire-cut machine. The brick are then re-pressed in a machine which shapes them perfectly and rounds the edges and corners. The re-pressed brick are then piled on steel cars and run into tunnel dryers for forty-eight hours. By this time they are thoroughly dry, when the cars are run out in the opposite end of the tunnels to a series of five rectangular down-draft kilns. The water-smoking is done with wood as usual, and the balance of the burning with soft coal. The brick are burned for about four days after water-smoking, when the temperature is raised sufficiently to vitrify them without causing the whole mass to fuse. The interior of the kiln is fire-brick. The open floor is composed of a specially large fire-brick block. The output of paving brick from this company is about five million per year. Pavements laid from these brick may be seen in Toronto between the car tracks of the Toronto street railway, and on the following streets: Simcoe, Pearl, Lombard, Henry, Duncan, Concord, also at the Union Stock yards, and at other places. Many of these have been down for fourteen years and are still in good condition. The company is also engaged in the manufacture of building brick both red and white, and its output of these brick is about four million per year. The brick are made in two Doig machines, are dried by the rack and pallet system and burned with wood in four large kilns, two of which are permanent up-draft kilns and two open-shed scoved kilns.

A series of analyses of the Hudson River shale used by this company in the manufacture of paving brick shows a very interesting variation, which corresponds very closely with the variation in an Erie clay bank in any part of the Province. This variation has been described above, namely, the removal of lime constituents from the upper part of the bank by ordinary surface weathering. These analyses from two different shale pits are given below, and it will be noticed how completely the lime has been removed from the upper parts of the formation. This corresponds entirely with the same change that has taken place in the Erie clay banks throughout the Province.

SHALE PIT No. 1.

	Alumina. Per cent.	Silica. Per cent.	Lime. Per cent.	Magnesia. Per cent.	Iron. Per cent.	Alkali. Per cent.	Loss. Per cent.
Top Shale	16.49	63.60	.99	2.40	5.27	2.34	8.71
Mid Shale	12.11	62.56	6.39	.73	9.45	1.56	12.50
Base Shale	14.77	41.63	19.71	2.71	4.60	1.28	15.33

SHALE PIT No. 2.

	Alumina. Per cent.	Silica. Per cent.	Lime. Per cent.	Magnesia. Per cent.	Iron. Per cent.	Alkali. Per cent.	Loss. Per cent.
Top Shale	18.62	60.01	.10	.20	10.15	6.70	11.45
Mid Shale	18.42	59.24	3.32	3.30	8.37	1.60	9.16
Base Shale	14.77	51.82	16.30	5.83	3.16	1.36	17.74

Portland Cement

Next to brick, the most important industry in Ontario, using clay as raw material, is the Portland cement industry. An account of the origin and development of this industry, and its rapid growth since its establishment in 1891, was given in the Report of the Bureau of Mines for 1903, and a fuller review in the Report for 1905, so that no attempt will be made here to describe the industry in detail. Reference will simply

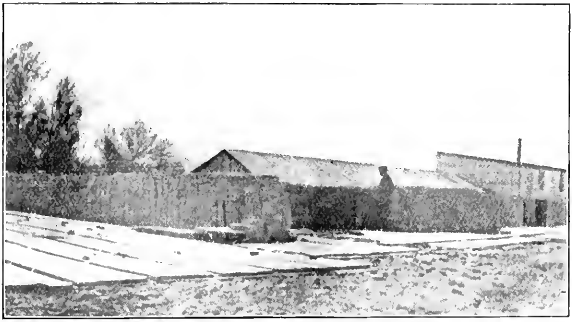

Fig. 66.—Goderich Cement Brick Co's plant, Goderich

be made to the classes of clay used in the manufacture of this important product. All the clays mentioned above, with the exception of the Saugeen clay, are used in some one plant or other in the Province. The Red-top clay is used by the National Portland Cement Company at Durham, Ontario. The clay is dug at Stratford, and hauled

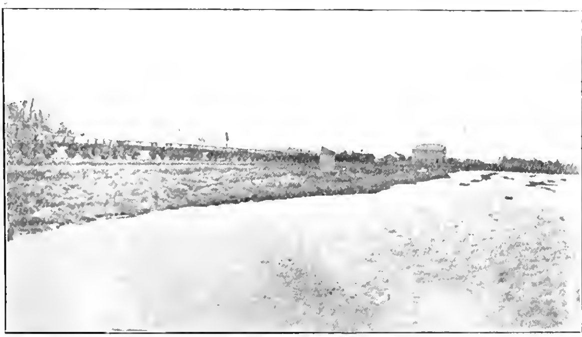

Fig. 67.—Digging Red-Top clay, which is shipped by rail from Stratford to Durham for the manufacture of cement by the National Portland Cement Co.

by Grand Trunk railway to Durham. Its composition is shown by analysis No. 4, page 17, of this report.

The Erie blue clay is used in some of the plants. In most cases it is dug close to the works, and usually below the marl beds, but in some instances it is also brought some distance, for example, the Blue Lake Cement Company, operating near Paris, bring their clay from Harrisburg by the Grand Trunk railway. This clay is one phase

of the Erie blue clay. In most other cases the blue clay is dug from beneath the marl, close to the company's plant. In the case of the Canadian Portland Cement Company, located at Strathcona, the marl is brought to the clay, the marl being dug at Marlbank. This was the old plant belonging to this company, but it is about to be abandoned in favour of the Marlbank works, where the marl and clay are dug together. The International Portland Cement Company, of Ottawa, use limestone with Leda clay, which is dug there from a bank about 25 feet deep. This is an excellent clay, having composition of Nos. 62, 63, page 31, of this report. An idea of the importance of clay in cement manufacture, can be gathered from the fact that the statistics for 1905 show that 1,251,300 barrels cement were manufactured, having a value of $1,783,451.

Tile Making

Another industry of considerable importance is that of tile making. Ordinary unglazed drain tile are made, or can be made, in almost every brick yard in the Province, while glazed sewer pipe are made by only three concerns. Drain tile are made from all classes of clay mentioned above, but the stronger clay is preferred. The clays are worked in any of the machines suited to the manufacture of stiff-mud brick, as described above, the form of the die being all that requires changing. Dies making from two-and-a-half to ten-inch tile are in common use, and in some cases, where special orders are received, these ordinary tile are made as large as eighteen inches in diameter. The tile are usually fourteen inches long, and about a half to three-quarters of an inch in thickness. As mentioned above, the stronger clays are preferable for tile making, as they are tougher and can, therefore, be worked stiffer, which is an advantage, since a softer tile will not retain its shape while drying. Freshly made tile should be stood on end for the first twenty-four hours, to prevent flattening. Moreover, they should not be exposed to the wind or sun, as the strong clay will usually crack if dried too quickly. (See fig. 70.) In burning tile they can be so nested, that is, set one within another, as to give a kiln great capacity. Most of the tile in the country are made from Erie blue clay, and burned creamy white. This clay often contains small pebbles of limestone, and the clay itself is highly calcareous. Both these ingredients are objectionable, as the small pieces of limestone, when burned to lime, as they are in the burning of the tile, cause the latter to burst, and even the presence of so much lime finely scattered through the clay, seems to cause the tile to scale. These defects can be almost entirely overcome by the addition of a half a shovelful of common salt, to the last two or three fires before the kiln is cooled. This addition of salt will not glaze the tile, as the temperature at which ordinary drain tile are made is not sufficiently high for glazing.

Sewer Pipe

The Toronto and Hamilton Sewer Pipe Company: In the manufacture of sewer pipe Medina shale is used with the composition shown in No. 23, under shales of Ontario, page 8, of this report. It is blasted out, and brought by Grand Trunk railway to Hamilton from Waterdown, a distance of four miles. Three cars of shale per day are used. The shale is ground in a panmill, and elevated to a hopper, which feeds the tile machine. The manufactured tile are stood in a drying room on end, till they dry sufficiently to be handled. They are then shifted to a hotter drying room, above the kilns, seven in number. These are round down-draft kilns, lined with fire brick. When the tile are well dried, they are stood on end in the kilns, and, after drying, require only forty-five hours to burn, including the glazing, which is done towards the end of the process. When the tile are thoroughly burned, and are raised to such a heat that they are just fusing, as shown by test pieces which can be lifted out by a poker, common salt is thrown in to each fire, and a good hot fire kept up. The salt fuses and is carried into the kiln, where it meets the tile, which are also just at the fusing temperature, and a splendid glaze is the result. After this, the tile are allowed to cool gradually, for about three days, when the kilns are emptied. Even then they are as hot as the men can handle. This company manufactures all classes

of sewer pipe, elbows, T's, etc. All the curved forms are made in plaster of Paris moulds, the clay being fashioned by hand, and all joints, etc., are carefully made by hand moulding. The company shipped four hundred cars of glazed tile of all descriptions last year, in addition to all local sales.

The Dominion Sewer Pipe Company, Swansea: This company, like the Toronto and Hamilton Sewer Pipe Company, gets its shale from Waterdown. This is the Medina shale, and three cars per day are brought to the works. This shale is ground in a wet-pan mill, which thoroughly pulverizes the clay, and at the same time tempers it to a good stiff mud. It is then carried by elevator to the top of the plant, where it feeds a large tile machine, making tile of all sizes from four to twenty-four inches in diameter. T's, elbows, reducers and expansion joints and all other classes of sewer pipe are made. These, of course, are moulded by hand in plaster of Paris casts, as described above in the Hamilton Sewer Pipe works. They, as well as the tile, are

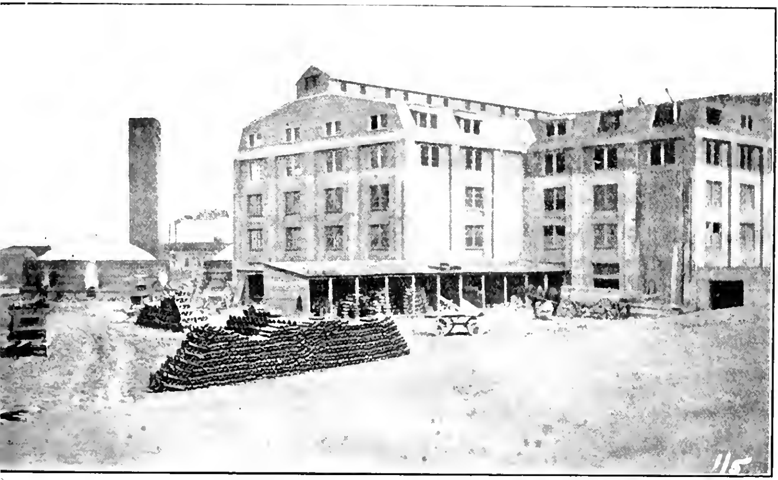

Fig. 68.—Dominion Sewer Pipe Coy's plant, Swansea: showing low down-draft kilns.

dried over a lattice floor by steam heat, and when dried are set in a series of six round down-draft kilns. When the tile are thoroughly burned, a salt glaze is put on as usual, after which they are allowed to cool gradually and are then ready for shipping. This is a new company which has not been in operation for a year as yet, so that their output is not known; but they report a very brisk demand for all classes of articles which they are manufacturing.

The Ontario Sewer Pipe Company, Mimico: This company, which is situated alongside the Grand Trunk railway tracks near Mimico, is also engaged in the manufacture of sewer pipe and all varieties of glazed pipe. They, like the others, get their clay shale at Waterdown, bringing it thirty miles by railroad. Their plant is in every way like the Dominion Sewer Pipe Company, so that a description of it will not be necessary. Their output is about equal to that of the Toronto and Hamilton Sewer Pipe Company.

The production of sewer pipe is expanding rapidly in Ontario. In 1900 the value was only $130,635, while in 1905 it was $225,835.

Pottery

The only other clay products of much interest in Ontario are pottery and terra-cotta. The pottery industry a few years ago was of great importance in Ontario, and almost every town had its local pottery. The manufacture of the better classes of pottery, stoneware, etc., in the southern parts of the States, where a better class of clays, much purer than the glacial clays found in Ontario, is to be found, has seriously interfered with the use of the Ontario clays, which are suitable only for the manufacture of common pottery. The result has been that nine-tenths of the potteries of Ontario have been forced to close, and those which remain are running on a very small scale. Pottery is made, however, from both the Red-top clay and the Erie blue clay; the first, turning out red pottery, suitable for flower-pots, etc., the second, a better pottery suitable for domestic purposes, such as churns, crocks, jugs of all sorts, and other common stoneware. The clay in all cases is well washed, and then worked by hand into the desired articles. Most of the white ware is glazed, the glaze varying to suit the requirement.

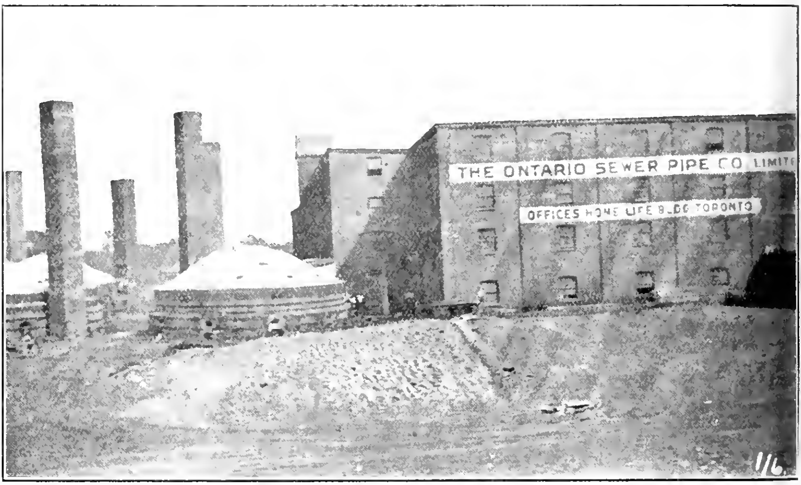

Fig. 69. Ontario Sewer Pipe Co's plant, Mimico, showing down-draft kilns used for sewer pipe.

As stated above, very few of the potteries formerly in operation in Ontario now exist. Most of them have been closed up; a few, however, are still engaged in the manufacture of flower-pots, butter crocks, churns, and jugs of various kinds, including vinegar and syrup jugs. The flower-pots, both red and white, are unglazed, while the other classes of pottery are glazed in various ways from clear transparent glazes through mixed glazes to deep brown and almost black. Among the potteries operating in Ontario the following may be mentioned:—J. Taylor, Port Hope, Durham county; Horning & Brownscombe, Owen Sound, Grey county; F. Burgarde & Son, Egmondville, Huron county; S. R. Burns, Bolton, Peel county; J. & G. Cranston, Hamilton, Wentworth county; S. P. Foster, Hamilton, Wentworth county; Wm. Stonehouse, Carlton West, York county; Joseph Davis, Davisville, York county.

The method of manufacture, the output and the varieties of goods made in all these works are about the same, so that a general description will be given for them. Both the Erie and Red-top clay are used in the manu acture of pottery. The Erie burns to a white color, while the Red-top burns to red. These clays are usually dug and

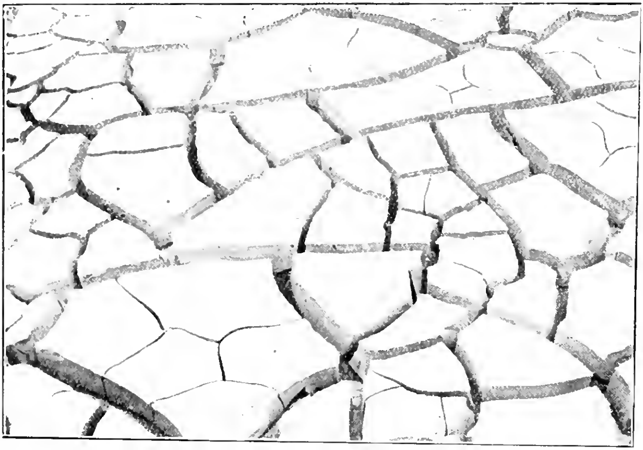

Fig. 70.—Strong clay left by potter to dry. Note shrinkage of clay on drying; hence necessity for adding sand to strong clay in brick-making to prevent cracking when drying.

re-washed so as to remove all sand, gravel, or other impurities. The washed clay is run into settling tanks and allowed to dry, or it is taken wet and is thoroughly beaten to remove all air from the interspaces in the clay, or, as the potters say to beat the

Fig. 71.—Huron Pottery, F. Burgarde and Son, Egmondville.

wind out of it. After this, the clay is either moulded by hand for certain of the forms, or is pressed into moulds for other forms. The articles are then slowly dried to prevent cracking, and when thoroughly dry are ready for the kilns if they are to be unglazed.

If glazed ware is required, the thoroughly dried articles are dipped into the required glaze several times until a sufficient coat has adhered. They are then placed in the kiln where they are slowly heated for three or four hours, after which they are fired up to a high temperature, about the same as for brick, that is, from 1700 to 2100 degrees Fahrenheit. The kilns are heated by wood or coal or coke, but the ware is not exposed to direct heat, that is, the fires do not lead through the ware. The inner lining of the kilns is built of fire-brick. The output varies with the demand, so that no definite list can be given. Some of the potteries have now gone into the manufacture of drain tile, since the demand for pottery is not brisk.

R. Campbell and Sons, Hamilton: This pottery deserves special mention, because it is one of the largest doing business in the Province. The business, however, has been largely increased by using foreign clays. A great deal of this comes from the United States.

The firm manufactures many varieties of pottery and stoneware. Tea-pots, coffee-pots, stove mouldings, stove linings, and all classes of ordinary stoneware, such as crocks, cuspidors, etc., including stone mugs, jugs and water-tanks, with many other varieties of products, are made by this firm. Most of the clay used is imported from the different parts of the United States, as these clays will stand much higher temperatures than the clays found in Ontario, and, therefore, a better class of stoneware and crockery can be made from them. The articles are all made in moulds, very little hand work being used in this factory. In many cases the clay forms are turned out as on a turning-lathe. The goods are all glazed, and after glazing are placed in jackets, which prevent one piece from touching another, while the jackets themselves can be stacked in the kiln and used over and over. This is the largest pottery doing business in Ontario at present, and it is the superiority of these clays which has enabled the manufacturers in the United States to replace the Canadian manufacturers in this line.

Terra-Cotta

Another industry closely allied to pottery-making is terra-cotta making. This branch of clay manufacture is not as flourishing in Ontario of late years as it was formerly. Since the burning of the Rathbun Company's terra-cotta plant at Deseronto, there has been little done in this line in Ontario. A few buildings have been erected, using Ontario terra-cotta, made by companies manufacturing pressed brick. Chief among these companies is the Toronto Pressed Brick Company, of Milton, Ontario; and also the Milton Pressed Brick Company, of Milton. The raw material used here is the red Medina shale, which is also employed in the manufacture of pressed brick. The shale is blasted, and pulverized by a panmill, after which it is wetted and thoroughly worked to expel all the air from between the particles, *i. e.*, the clay is worked, and beaten, till it becomes very close in grain. Plaster of Paris moulds are made from the drawings of the articles required; from these moulds plaster of Paris casts are made and these in turn are covered by the compact clay. The plaster of Paris is then removed, and the clay model is thoroughly dried, after which it is burned in the usual way. Most of the terra-cotta used in Ontario recently has been imported from the United States, where it has been claimed that the clay is much purer, but since these companies in Ontario have been using the ground shales, the quality of red terra-cotta could not well be improved. The largest manufacturer of terra-cotta is Mr. Lewis, who operates the Toronto Pressed Brick works at Milton, and splendid examples of his work may be seen at the Macdonald Institute building recently erected at Guelph, Ontario. For any of the other colors of terra-cotta goods, for example, the buff, cream, white, etc., suitable clays have not yet been found in the Province, but for those requiring red terra-cotta, that manufactured from our Medina shale could scarcely be improved on.

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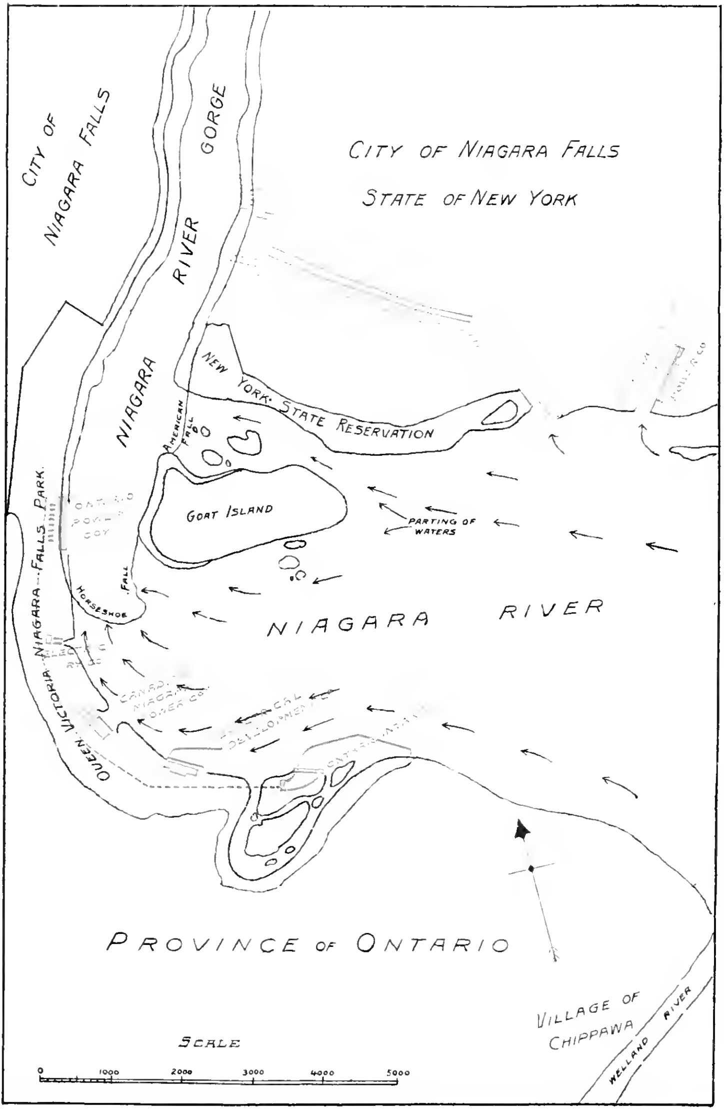
FINIS

Queen Victoria Niagara Falls Park

Map Showing Location of Power Works at Niagara Falls.

To Accompany Twentieth Annual Report of Commissioners.



Niagara Falls,
January 1906

James Wilson
Superintendent

Twentieth Annual Report

of the

Commissioners for the Queen Victoria Niagara Falls Park

1905

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1906

COMMISSIONERS OF THE

QUEEN VICTORIA NIAGARA FALLS PARK.

J. W. LANGMUIR, *Chairman*.
GEORGE H. WILKES.
ROBERT JAFFRAY.
P. W. ELLIS.
L. CLARKE RAYMOND.

Superintendent: JAMES WILSON.

Chief Gardener: RODERIC CAMERON.

Twentieth Annual Report of the Commissioners for the Queen Victoria Niagara Falls Park.

To the Honourable W. MORTIMER CLARK, K.C.,
Lieutenant-Governor of the Province of Ontario:

MAY IT PLEASE YOUR HONOUR:

The Commissioners for the Queen Victoria Niagara Falls Park beg to submit their twentieth annual report (being for the year 1905), together with the usual statement of receipts and expenditures, the report of the superintendent on the works of improvement and maintenance which have been carried on in the various portions of the park system during the year, and also in connection with the works for the development of electrical power. There is also appended the text of memoranda and official documents to which reference is made in the report.

Since the last annual report several changes have taken place in the personnel of the Board. Commissioners James Bamptfield, of Niagara Falls, and A. W. Campbell, of Toronto, resigned, after a service on the Commission of over eight years and six years respectively. The vacancies thus caused were filled in June last by the appointment by Order in Council of Mr. P. W. Ellis, of Toronto, and Colonel L. Clark Raymond, of Welland.

Before entering upon a general review of the various matters which have engaged their attention during the year, the Commissioners desire to make reference to certain adverse criticisms which have appeared in newspapers and magazines both in Canada and the United States respecting the utilization of the waters of the Niagara River at the Falls for commercial purposes.

Without doubt much of the wide spread interest taken in the matter was created by the strenuous efforts made at the last Session of the Legislature for the State of New York by a corporation known as the Niagara, Lockport and Ontario Power Company, to procure the passage of legislation conferring on that company the right to take from the Niagara River a sufficient quantity of water to generate four hundred thousand electrical horse power. It was estimated by the State officials that such a grant would involve the continuous withdrawal of over thirty-six thousand cubic feet of water per second, a quantity equal to about one-sixth of the total volume of outflow from Lake Erie at mean water level. The New York State Legislature actually passed the Bill, but it was vetoed by the Lieutenant-Governor, and thus failed to become law.

The magnitude of the proposition, and the strong efforts put forth in the State Legislature, both for and against the measure, had the effect of creating a wide spread public sentiment against such enormous withdrawals of Niagara water for power purposes. This sentiment was greatly strengthened by the appearance of certain magazine articles calling upon the public to petition the government against such grants, and suggesting at the same time that international action be taken to prevent the exploitation of such schemes in the future.

One of the results of this public agitation has been a disposition on the part of some to adversely criticise the policy of the Commissioners of the Queen Victoria Niagara Falls Park in recommending the Government to grant corporate franchises for the development of power on the Canadian side of the river, more particularly as the works were to be located within the grounds set apart for a public park. The Commissioners, therefore, desire to clearly state all the facts and circumstances which led them to make the recommendations in question.

It will not be disputed that the great works of the Creator were primarily and chiefly intended for the service of man, and that each succeeding generation witnesses some new achievement in the scientific adaptation of nature's forces, which is everywhere eagerly seized upon and utilized for the convenience, comfort and advancement of the race. It was only to be expected, therefore, that the gigantic forces of nature which have for countless ages been engaged in cutting the channel of the Niagara River through the limestone formation from Queenston Heights to the present location of the great cataract, and the lavish display of power there witnessed should have been made the subject of scientific investigation with a view to its adaptation for some economical use.

It is, however, only within the last twenty years that the marvelous developments which have been made in the science of creating and transmitting electricity have opened up a practical method for the economical adaptation of the Titanic forces at work at Niagara Falls for the advancement of industrial operations by the supply of electrical power on the large scale demanded by the newly discovered electrolitic processes of metallurgy, and for its transmission to all points within a radius of hundreds of miles of the cataract. These scientific discoveries were promptly availed of by capitalists, and hydro-electric works upon a large scale were undertaken on the American side of the river in 1889, when several charters were granted for the use of Niagara River water for this purpose.

The Park Commissioners on the Canadian side to whom had been entrusted the administration of the water power within the park conceived it to be their duty in the public interest, and apart altogether from questions of revenue, to secure similar advantages for the advancement of Canadian industries, and to that end recommended the Government of Ontario to grant franchises, by which, under certain restrictions, the waters of the Niagara River might be taken on the Canadian side for the generation of electricity for general commercial purposes. These recommendations were all concurred in by the Government, and given effect to by the Provincial Legislature from time to time.

The sources of the Niagara River, reaching out as they do into no less than seven States of the Union, in addition to the Province of Ontario, and as the Niagara River forms the boundary line between the Province of Ontario and the State of New York, it will generally be admitted that any questions relating to the extensive use of its waters should come within the scope of international jurisdiction; and, as the relative drainage area in each country into the great lakes and through the Niagara River is approximately the same, the withdrawals of water on each side of the line should in theory be approximately equal. When, however, physical conditions and local features are taken into account we find that throughout the entire course of the upper river the deep channel is on the Canadian side; and from the very commencement of the rapids above the Falls, the whole trend of the water in the main channel is towards the Canadian shore, resulting in the flow over the Canadian Falls being equal to about ninety per cent. of the entire waters of the river.

The average outflow from Lake Erie through the Niagara River has been determined by United States engineers to be 222,400 cubic feet per second, which under the difference in elevation found between the summit of the upper rapids and the base of the Falls (about 210 feet) will produce a theoretical energy equivalent to about 5,300,000 horse power. In practice, however, it is necessary to make substantial reductions from the theoretical power of a water fall owing to the impossibility of utilizing the full head of water, and also because of the energy lost in hydraulic and electric machinery. It is, therefore, only under most favorable circumstances that even two-thirds of the nominal power may be obtained for power purposes.

The water supply to the Erie Canal on the American side, and to the Welland Canal on the Canadian side was not included in the measurement of volume of flow made by the United States engineers referred to, but the quantities taken are about equal in each case.

In deciding what would be an equitable International distribution of the water flowing over Niagara Falls, it should be kept in mind that the works which have been constructed at Chicago for the drainage of the sewers of that city into the Mississippi River, and the creation of a hydro-electric plant in connection therewith, involving the withdrawal from the lake system of 60,000 cubic feet per minute, or 10,000 cubic feet per second, practically lessens the flow over the falls to that extent.

In estimating the cubic feet of water per second required to operate to their full capacity the various power companies now exercising their franchises on both sides of the river, regard must be had to the actual heads that each company works under. A comparative statement of this is shown in the following summary, viz:

American Side.

Chicago Drainage Canal	32 feet
Niagara Falls Power Company	136 "
Niagara Falls Hydraulic and Manufacturing Company	210 "

Canadian Side.

Canadian Niagara Power Company	136 feet
Electrical Development Company	136 "
Ontario Power Company	180 "

It will thus be seen that the Niagara Falls Hydraulic Power and Manufacturing Company, which takes its supply from an open canal carried from the river above the rapids through the City of Niagara Falls to the edge of the cliff, and discharges its spent water into the gorge immediately below, is the only one at Niagara Falls which uses anything like the full available head. The Ontario Power Company comes next, operating under about 86 per cent. of the total head: the works of the remaining three companies, one on the American side and two in the Queen Victoria Park, use only about two-thirds of the full head, requiring, therefore, a much greater quantity of water to produce an equivalent amount of electric power. Under these varying conditions the companies now exercising their franchises will probably require for the ultimate operation of their works the following quantities of water, viz.:

American Side.

	Electrical Horse Power.	Approximate water required Cu. ft. per sec.
Chicage Drainage Canal	27,000	10,000
Niagara Falls Power Company	200,000	17,200
Niagara Falls Hydraulic and Manufacturing Co.	100,000	5,600

Canadian Side.

Canadian Niagara Power Company	100,000	8,600
Electrical Development Company	125,000	10,750
Ontario Power Company	180,000	11,700

These figures show that when these various power works are in full operation, the water required on the American side will amount to 32,800 cubic feet and on the Canadian side of the river 31,050, making a total of 63,850 cubic feet of water per second that may be withdrawn from the Niagara River for electrical power purposes, in addition to the water required for the general manufacturing purposes now carried on in connection with the Niagara Falls Hydraulic and Manufacturing Company's canal.

The Chicago Drainage Canal is now taking about 5,000 cubic feet of water per second; the two power companies on the American side at Niagara Falls about 9,000, and on the Canadian side about 3,000, or a present aggregate withdrawal equal to about one-fourth of the total ultimate requirements of the works under construction. It will thus be seen that the volume of water now flowing over the crest of the two falls has already been reduced from 222,400 to about 205,000 cubic feet per second, or about seven per cent. less than the mean or average flow extending over a long term of years. This small reduction has, of course, had no appreciable effect upon the falls. When, however, the full compliment of water is taken by each of the companies referred to, the flow over the falls will then be only about 77 per cent. of the present volume. In other words, the total amount of water required for the full operation of the hydro-electric works already completed or in process of construction will necessitate the withdrawal of 23 per cent. of the present flow over the Canadian and the American Falls.

As the quantity of water required for the operation of these works will vary from time to time, according to the amount of electricity which the several companies may be enabled to market it will in all probability be many years before the total quantity of water thus indicated will be required, and in any case the withdrawals up to the maximum requirements will be very gradually made.

Just what the ultimate effect the abstraction from the river above the falls of such a large percentage of its water will have upon the appearance of the two falls is, of course, a matter affording room for a wide divergence of opinion. The volume of flow will, of course, be greatly reduced, but on the other hand the width of the Horse Shoe Falls at the crest line has been considerably narrowed in on the Canadian side, and the force of the current will be diminished. On the whole the Commissioners are of the opinion that the resultant effect will not seriously detract from the scenic beauty of the twin cataract to any great degree.

It must, however, be pointed out that the franchises now in operation are not the only companies that have been granted statutory authority to take water from the Niagara River, or from its source of supply, for the pur-

poses of developing power. In addition to the several companies already referred to, whose works of development are in a more or less advanced state, there are no fewer than six charters on the American, and four on the Canadian side of the boundary, in respect of which work has not yet been commenced. It is important, therefore, that all rights granted for prospective operation, and which, if not forfeited or annulled, may be proceeded with at any time, should be kept in view. The following memorandum has, therefore, been prepared giving in condensed form the charters granted on each side of the river as far as the Commissioners have been able to ascertain, viz.:

On the American Side.

Name.	Date of author-ization.	Cubic feet per second.
1. The Niagara Falls Hydraulic Power and Manufacturing Company	1879	Not defined.*
2. Lockport Water Supply Company	1886	Unlimited.
3. Lewiston Water Supply Company	1888	Unlimited.
4. Niagara Falls Power Company	1889	Approx. 17,200.
5. Buffalo and Niagara Power and Drainage Co.	1889	Unlimited.
6. Chicago Sanitary District	1889	10,000.
7. Niagara County Irrigation and Water Supply Company	1891	Unlimited.
8. Niagara Power and Development Company	1894	Unlimited.
9. Niagara, Lockport and Ontario Power Company	1894	Unlimited.

In addition to these franchises, the International Paper Company at Niagara Falls and the Niagara Falls Water Works Company each use considerable quantities of water.

On the Canadian Side.

Under agreement with the Queen Victoria Niagara Falls Park Commissioners.

Name.	Date of author-ization.	Cubic feet per second.
1. Canadian Niagara Power Company	1892	Approx. 8,600.
2. The Ontario Power Company	1900	Approx. 11,700.
3. Electrical Development Company	1903	Approx. 10,750.

The Ontario Power Company has a franchise for taking water from the Welland River, in addition to its Niagara River rights.

Chartered by the Dominion of Canada.

4. The Niagara-Welland Power Company	1894	Unlimited.
5. The Jordan Light, Heat and Power Co.	1895	Unlimited.
6. Erie Ontario Power Company	1903	Unlimited.

In addition the Cataract Power Company at DeCews Falls obtains a comparatively small supply from the water of the Welland Canal and the

*This Company claims the right to take from 8,000 to 10,000 cubic ft. per second for all purposes.

Niagara Falls Park and River Branch of the International Rilway Company the water necessary to operate its road.

From this summary it will be seen that of the ten non-developing companies that have been granted authority to use Niagara water on both sides of the river, none are in any way limited in respect to the quantity which may be taken for development purposes. Should all of these companies exercise the privileges conferred, and should their undertakings be carried out upon anything like the scale adopted by the companies whose works are now in course of construction, there can be no question but that the Falls of Niagara as a scenic spectacle would be most seriously impaired, if not entirely destroyed.

It is obvious, therefore, that the public agitation for restriction in the further abstraction of Niagara River water is well founded, and that it is absolutely essential for the preservation of Niagara Falls that the Governments territorially interested should cause a full investigation to be made without further delay, in order that the great cataracts may be saved from irreparable spoliation.

It may be here pointed out in respect to the three companies operating on the Canadian side, that all the water withdrawn from the river will be returned to it immediately below the Horse Shoe Falls, and that the two companies operating on the American side will deliver their waste water a very short distance below the American Falls, so that the volume of water in the lower river and rapids will not in the slightest degree be diminished by the operations of these companies.

The Commissioners have frequently drawn attention in their reports, to the possibility of economically developing large blocks of power from the lower rapids by taking advantage of the fall in the river both above and below the whirlpool. Should it be decided by the Governments interested to place restrictions on the further use of the water above the falls, doubtless the attention of capitalists will be drawn to the great possibilities for power development here presented. This second use of the water for commercial purposes could be accomplished without in any way injuriously affecting the grand scenic features of the lower river.

Having shown the volume and capacity of the flow of water in the Niagara River, and the relative extent to which the granting of charters for power production has been carried on in the United States and Canada, the Commissioners now desire to give the reasons which influenced them in recommending the granting of franchises for the development of electric power in the Queen Victoria Niagara Falls Park.

As Canada possessed at least an equal right with the United States in the use of Niagara waters, and as a strong public sentiment demanded that the Province of Ontario should equally share in the great advantages that will result from the electrical development of part of the enormous hydraulic power of the Falls, the Commissioners, in the performance of the duties cast upon them, gave very careful consideration to an application which was made in 1889 for water privileges within the Park.

At that date, no less than five charters had been granted by the New York State Legislature for the use of Niagara water for power purposes on the American side, two of which, namely, the Niagara Falls Hydraulic Power and Manufacturing Company, and the Niagara Falls Power Company, were actively engaged in the construction of their works. The Commissioners, therefore, decided that in order to protect Canadian interests it was necessary that franchises for the development of power should be granted on the Canadian side, but that these privileges should not be granted without a fair compensation by way of yearly rental being made. As the

physical conditions in the Park were found to be particularly favorable for the carrying out of such works, an interim agreement was entered into with eminent English capitalists, by which, in consideration of a large forfeitable deposit, time was granted to organize a company for the carrying out of the work. Owing, however, to a long continued depression in the money market, the promotors were obliged to abandon the project.

Application was then made for the privilege by American capitalists engaged in developing electrical power on the American side, conditioned, however, that they should have the exclusive right to operate within the Park. After prolonged negotiations and endeavors to free the application from exclusive rights, having failed, an agreement was entered into in 1892 with the Canadian Niagara Power Company, under which it was granted exclusive authority to develop the water power of the Falls in the Park for the generation of electric or pneumatic power. This agreement was approved by the Government, and afterwards confirmed by the Legislature of Ontario by special Act, 55 Vict., Chap. 8.

In making this agreement, the Commissioners required that a substantial money payment should be made by way of annual rental for the privileges granted, and also stipulated that one-half of all the power generated should be available for Canadian consumers at rates not to exceed those charged upon the American side for similar quantities of electric power.

After several years' delay, chiefly owing to the inability of the company to secure the large capital necessary for the carrying out of the undertaking, the rights which had been granted were on the recommendation of the Commissioners annulled by the Legislature, and the payments of rental which had been made were forfeited. A second agreement was, however, entered into with the same company in 1899, granting restricted powers, an amended scale of rentals, and abolishing entirely the exclusive rights before enjoyed. In the meantime additional water power charters had been granted by the State of New York and also by the Government of Canada, differing, however, from the charters negotiated by the Park Commissioners, inasmuch as not in a single instance were any restrictions made in respect to the quantity of water which might be taken or in obtaining payment for the valuable privileges conceded, except in the case of the Cataract Power Company, which takes its supply from the Welland Canal.

During the period that the Canadian Niagara Power Company had exclusive privileges for generating power in the Park, the Ontario Power Company, which had received a charter from the Dominion of Canada for the same purpose, made an application to the Commissioners to be allowed to proceed with their works, which application could not be granted on account of the exclusive privileges given to the Canadian Niagara Power Company. As soon, however, as these exclusive rights were annulled, the application was renewed, and in the year 1900 an agreement was arrived at. This agreement did not contemplate the taking of water within the Park limits, but from the Welland River, which flows into the Niagara about a mile up stream from the southerly boundary of the Park. The franchise granted contained similar provisions and restrictions as to works, rentals and the reservation of power for Canadian consumers as were made in respect to the Canadian Niagara Power Company. Owing to physical difficulties encountered in using water brought from the Welland River, the Ontario Power Company made a further application for the right to take water from the Niagara River, which, after due consideration, was granted and an agreement entered into in 1902, under the terms of which the company, in consideration of an increased payment, was authorized to tap the Niagara River at the Dufferin Islands, and by means of underground constructions

develop electricity in a power house situated in the Gorge immediately below the Falls.

The Canadian Niagara and the Ontario Power Companies prosecuted their respective undertakings with great energy, and each of them have now ready for commercial use about thirty thousand horse power of electric energy, only a small proportion of which, hoewever, has as yet found a market in Canada.

It may here be noted that of the companies operating on the American side, the Niagara Falls Hydraulic Power and Manufacturing Company has at present an output capacity of 34,000 horse power, all of which is marketed in Niagara Falls, N.Y.; and the Niagara Falls Power Company, which has machinery installed for 100,000 electrical horse power, of which quantity 45,000 is now furnished to industries at Niagara Falls, N.Y., and 30,000 electrical horse power is transmitted to consumers in Tonawanda, Lockport and Buffalo.

Up to the time of granting the second franchise to the Ontario Power Company, in 1902, public sentiment in Canada appeared to be entirely in favor of the course pursued by the Commissioners respecting the development of power on the Canadian side of the river. A short time after this, however, application was made on behalf of a very strong combination of Canadian capitalists for a third site in the Park for the development of electricity upon a large scale, and the plea was advanced that as the companies then holding franchises within the Park limits were almost wholly controlled by foreign capital, it would be most unjust to refuse Canadians an opportunity of demonstrating their ability to execute such important works upon equal terms with the American companies.

This application met with considerable opposition on the part of rival interests and portions of the press, chiefly upon the American side, severely criticising the principle of granting charters which would be exercised in a public park. Before the Commissioners took the application into consideration, the chairman prepared a memorandum setting forth all the conditions, hydraulic, scenic, International and economic which were in any degree affected by the proposal, and submitted the same for the consideration of the Government, with a request that all questions of policy and expediency should be determined by the Government, and recommending that in respect to the hydraulic features of the case independent expert engineering opinion should be obtained.

After the hearing given by the Government to all parties interested, and an examination made of the reports made by the expert engineers engaged to investigate the hydraulic questions involved, the Government decided that the application should be granted, and accordingly an agreement was entered into in January, 1903, for the carrying out of this important undertaking.

Having thus given a brief outline of the circumstances and conditions which led the Commissioners to recommend that franchises should be given to the Canadian Niagara Power Company, the Ontario Power Company and the Electrical Development Company of Ontario for utilizing the waters of the Niagara River within the Park, and only in respect of which are the Commissioners in any way responsible, reference may now be made to the financial considerations, and which by some are considered only of secondary importance, which were made an indispensable condition to the granting of every franchise.

In their previous reports the Commissioners have stated that when the Government of Ontario decided to create a Park system at Niagara Falls, it was upon the distinct understanding that the undertaking should be made

self-sustaining, and that it should not become a permanent financial burden upon the Province. The necessity therefore was laid upon the Commissioners to devise measures whereby the large sums annually required to police, maintain and improve the property, and in addition to obtain the means of paying the interest on the debentures issued for the acquirement of the territory included in the Park domain, should be provided.

As the means first adopted for this purpose proved entirely insufficient, the Commissioners were in a measure, apart from the duties laid upon them to keep pace with the industrial development on the American side of the river, obliged to take advantage of the opportunity afforded by the granting of water power privileges to add to their income, with the result that in every instance in which rights have been granted it has been made a *sine-qua-non* that equitable compensation should be made therefor. Of all the franchises which have been hitherto granted on either side of the river, only from those negotiated and chosen by the Commissioners has a yearly rental been exacted, the amount received from such franchises up to the present time amounts to over $400,000.

Had it not been for these substantial receipts, the Commissioners would long ere this have been obliged to call upon the Provincial exchequer for large annual grants in order that the extensive territory now included in the Park system might be maintained and developed.

It is frequently charged that the Commissioners by authorizing the various works and constructions required for power development to be located within the Park, they have thereby violated the trust imposed on them by permitting more or less desecration of the aesthetic surroundings of the Great Cataract, which it was their special province to preserve. This phase of the subject has been dealt with in previous reports, but as misapprehension still exists, the Commissioners, in defence of their action, must again point out that nearly all the works which will permanently appear upon the surface within the present Park limits are distinctly outside the territory which was originally intended to be appropriated for Park purposes. Fortunately, however, the territory in question was extended so as to take in all the frontage along the river above the Falls as far as the head of the upper rapids. Had this not been done, the whole of this area would undoubtedly have been turned into a manufacturing district, with all kinds of erections over which no control could be exercised by the Board. As it is, no buildings or constructions can be put up until the plans have been submitted to and have received the approval of the Commissioners. The several companies to whom franchises have been granted have invariably met the views of the Commissioners in respect to the character of the works appearing on the surface of the Park in a most liberal manner, and in consequence, the works and buildings already constructed are of a high type of architectural beauty, having all been specially designed by skilled artists with reference to their location in a public park. The design for the power house of the Electrical Development Company and the finish to be given the Spillway building (the only two structures not yet completed) have each received the most careful attention, and the Commissioners feel assured that when all these works and structures are fully completed and the surface surroundings are finished and planted in the manner designed, that they will be entirely acquitted of the charge of violating the trust imposed in connection with the Canadian environment of Niagara Falls. On the contrary, the Commissioners fully believe that when these great electrical works—the greatest of the kind in the world—are in full operation, they will greatly add to the attractiveness of Queen Victoria Niagara Falls Park.

In concluding their references to the present and prospective relations of the power development works to the future of Niagara Falls, and having regard more especially to the serious impairment, if not the practical destruction of the beauty and scenic effects of the Cataract through further diversion of the river waters, the Commissioners desire to offer the following suggestions:—

(1) That the whole subject, involving the further diversion of water from Niagara River for power development in excess of the charters now being exercised be referred to an International Commission, appointed by the Governments directly interested, territorially or otherwise, in order that an agreement may be arrived at between such Governments as to further withdrawals of water on both sides of the river.

(2) That a careful enquiry be made by the Governments indicated respecting the charters already granted, but in regard to which no works whatever have been commenced, with a view to the cancellation of the same.

The Commisioners now desire to refer to the general works which have occupied their attention during the past season, and a brief reference may first be made to the progress of the three power companies whose works have so frequently been referred to.

Canadian Niagara Power Company.

In their last Annual Report the Commissioners referred to the completion by the Canadian Niagara Power Company of the first instalment of power required under the terms of their agreements, and to the inaugural ceremonies held on the 2nd January, 1905, when in the presence of the Commissioners and of the chief officials of the Company two of the ten thousand horse power generators were tested and found to be ready for service. Since that time a third generator of equal capacity has been completed, and work upon two others is now in an advanced state.

It has been a matter of regret to the Commissioners that owing chiefly to delays in the construction of transmission lines, the company have so far been unable to market to any large extent the product of the first two generators. Electricity is, however, now being furnished by this company for the lighting of the City of Niagara Falls and for local industries, but as the total amount of power required for these purposes is alleged to be within the quantity which the company is entitled to use under the provisions of its agreement in respect to the fixed rental, no payments have yet been made on account of such excess over the ten thousand horse power authorized.

The completion of the forebay and intake works of this company enabled the lands reclaimed from the river in front and north of the power house as far as the railway and city intake to be levelled off and surfaced with good soil, when planted this area will become a very attractive addition to the Park.

The Commissioners greatly regret the removal by death of Mr. W. B. Rankine, the First Vice-President and General Manager of this Company, who has from the beginning been actively interested in the various projects connected with power development for commercial purposes at Niagara Falls. The Commissioners desire to place on record their appreciation of the marked ability and unfailing courtesy which characterized Mr. Rankine in all his dealings with the Board, extending over a period of more than thirteen years, and their extreme regret that he should have been taken away at the moment when the fruition of his labors was in sight.

ONTARIO POWER COMPANY.

The Ontario Power Company have displayed great energy in the prosecution of their works throughout the year. By mid-summer all the vast works from the intake at Dufferin Islands to the power house below the Falls were sufficiently advanced to permit of the water being turned in and the machinery and appliances tested, and on the 1st day of July last the first generator of ten thousand horse power capacity was placed in commission, and the current sent over the company's temporary transmission line.

Since that date the handsome buildings for the gate and screen houses at the south end of the Park, the first section of the power house in the Gorge, including machinery for the generation and control of 30,000 electrical horse power, have all been completed, and the large area of Park surface which had been torn up by the Company's works has been restored and surfaced with good soil.

The only unfinished work of this Company in the Park is the overflow and regulation chamber at the northern terminus of the pipe line, near the Park pavilion. Owing to the location of these works at the narrowest part of the Park, and the necessity for a considerable elevation above the Park surface in order to ensure a perfect regulation of the flow of water in the main pipe, the plans for the structure and its immediate surroundings at this crucial point have occupied the attention of the Board and the Company at many protracted meetings during the year. As a result of this prolonged consideration, however, the Company have at length submitted plans, which in the opinion of the Board will not only meet with the approval of the public, but will afford increased facilities for viewing the Falls to the greatest advantage from new and artistically constructed view points, at an elevation which will command excellent prospects not only of the Falls but also of the upper and lower river.

When approval was given to the plans of this Company's power house, situate in the Gorge of the river below the Falls, permission was granted for the construction of an electric elevator, by means of which access could be had to the floor of the power house from the street level; as the plans provided for an open steel tower, it was feared that any construction at this point, no matter how artistically designed, would prove objectionable, and might seriously interfere with the view of the Horse Shoe Fall from various points in the Park. The Commissioners, therefore, entered into negotiations with the Company for a change in plan which would do away with the exposed structure, and by means of a tunnel carried into the cliff and a shaft ascending at a point in rear of the railway tracks, afford a means of access to the transformer house on the elevation overlooking the Park. This arrangement was finally made, and the work is now in progress, and when completed the elevator, which was long used for taking visitors behind the "Sheet of Water," will be removed.

ELECTRICAL DEVELOPMENT COMPANY.

Excellent progress has been made during this year by this Company in the construction of its works. The river structures have been practically completed, and the foundations of the power house carried up to floor level. The wheel-pit and all underground work is about ready for the hydraulic machinery, which is now being delivered.

A large section of the heavy steel framework of the power house has been erected, and the stone-work, which is to form the outer casing of the

building, has nearly all been cut and stored on the ground ready for building operations in the spring.

A large section of the cofferdam, by means of which the river bed was unwatered so that the construction of the water walls and other works might be proceeded with, has been taken away, and the river bed outside the overflow wall is now restored to its former condition.

The agreement entered into with the Company for the utilization of the surplus water found in its forebay, and to which reference was made in last year's report, failed to receive the ratification of the Legislature, and, therefore, did not become operative.

The International Railway Company.

A controversy has arisen with the International Railway Company, as successors to the Niagara Falls Park and River Railway Company, in reference to the interpretation of a clause in the Act under which the Railway Company claims very extensive powers in respect to the generation of electricity in their power house in the Park. The subject is referred to at some length in a memorandum appended to this report, but may be briefly summarized as follows:

In the original agreement made in 1891, the Company were authorized to take water from the river for the purpose of *operating and lighting* the railway, and the Ontario Legislature of 1892 incorporated the railway, under the name of the Niagara Falls Park and River Railway Company, and confirmed the agreement entered into with the Commissioners. In 1900 the Buffalo Railway Company, incorporated by the Government of Canada, acquired the franchise and property of the Niagara Falls Park and River Railway Company, and a confirming Act was passed by the Legislature in 1901 (1 Edward VII., Chap. 86), but in this confirming Act the clause limiting the electric power which the Company might generate was changed to read, "the purposes of any Railway Company which purchases the franchise of the Company."

In 1902, both the Parliament of Canada and the Legislature of Ontario, granted authority to substitute the title *International Railway Company*, for the Buffalo Railway Company, but in all these various Acts the jurisdiction and control of the Park Commissioners were specifically reserved.

The company made application in October, 1903, to the Commissioners for approval of plans, showing a system of conduits for carrying electric wires, extending from the Company's Power House, through the Park to the Upper Steel Arch Bridge, the object being to carry electric power, generated in the railway Power House, across to the United States to operate the extensive railway system of the company in that country, and claiming authority under the legislation of 1901 for so doing.

The Commissioners could not see their way clear to accede to the demands of the company, and as the claim of the company opened up important questions of law and policy, in respect of which legal counsel disagreed, the Commissioners referred the whole question to the Government for a decision.

Submerged Dam.

The City of Niagara Falls under an agreement with the Commissioners obtains its water supply from the Niagara River a short distance south of the brink of the Falls. Owing in a large measure to the recession of the Falls, and possibly in some degree to the temporary coffer dams placed in

the river to facilitate the construction of the power works, the level of the water at the joint intake of the city and the railway company was not high enough to secure a full supply of water for driving the hydraulic pumps at seasons of the year when ice is running in the river. In consequence of this it is claimed by the Corporation of Niagara Falls, the water works system has for several years been obliged to shut down in severe winter weather, leaving the city without sufficient water for household purposes, and without fire protection. The city authorities, therefore, applied to the Commissioners to obtain some measure of relief, particularly as they claimed that the low level was caused by the construction works referred to. The Commissioners while not agreeing with the contention of the city authorities, but having regard to the seriousness of the situation and after consultation with Mr. Isham Randolph, the eminent Engineer of Chicago, decided to build a submerged dam opposite the north end of the intake, and thus raise the level of the water a foot or so for the benefit of the city.

As the point in question is only a very short distance from the brink of the Falls, and the current is very swift, it was considered inadvisable to adopt any of the usual methods of constructing a dam. Mr. Randolph, however, designed a concrete column, fifty feet high, divided into sections, and connected together by a chain passing through the centre. This column was built on a high trestle, and when completed was tipped bodily into the river, the trestle floating away and leaving a clear space next the shore for passing ice, the concrete column forming a solid barrier to the passage of the water. Unfortunately in falling, the column rested upon a series of large boulders, which prevented it accomplishing its full purpose, although the water was permanently raised about ten and a half inches.

Outlying Parks.

The outlying park territory at Fort Erie, Niagara Glen, and Queenston Heights, was duly cared for, and sundry improvements carried on during the year, full particulars in respect to which will be found in the Superintendent's report.

At Fort Erie, the Monument which, through the generosity of the Dominion Government, the Commissioners were enabled to erect in honor of the gallant heroes who fell in the many engagements which took place in the War of 1812-14, for the possession of this fortress, has been completed; but as the breaking up of the Military Camp at Niagara took place before completion, it was found impossible to arrange for suitable unveiling ceremonies. The shaft is of Canadian Granite, with bronze inscription tablets, and is a valuable addition to the southern terminus of the park system.

Fairly good progress was made during the season in protecting the shore line of the upper river from further erosion by the use of stone riprap Several additional strips of property were acquired for the purpose of widening the roadway, which runs along the margin of the river. The Commissioners are very anxious to prosecute this work with vigor, but have hitherto been unable to do so owing to the want of sufficient funds.

A broad boulevard along this connecting link, between the Park at Niagara Falls and Fort Erie is most desirable, as it would form a magnificient approach to the Falls from Buffalo and the south.

Reference was made in the last annual report to the main north entrance to the park, in front of the Clifton House; as this road was exceedingly narrow, and dangerous to traffic, the Commissioners have been endeavoring for years to secure a strip from the adjoining proprietors, in order to make a wide and well finished approach to the Park from the City of Niagara

Falls, and also from the Steel Arch Bridge, by which the heavy volume of American and foreign travel has access to the park. Taking advantage of the reconstruction of the Clifton House, the Commissioners have acquired by purchase, a sufficient width to afford a suitable approach, and as soon as the new Clifton House building is completed, the road will be graded, and the entrance to the Park completed.

General Maintenance.

All the ordinary works required for the maintenance of the extensive park property have been carried on throughout the season, a full reference to which will be found in the report of the Superintendent of the park, which is appended hereto. The statement of receipts and expenditures for the year will be found attached, also the report of the Superintendent upon the proposal to construct a dam at the foot of Lake Erie.

All which is respectfully submitted.

Sgd. J. W. Langmuir,
Chairman.
Sgd. George H. Wilkes,
Sgd. Robert Jaffray,
Sgd. L. Clarke Raymond,
Sgd. P. W. Ellis.

QUEEN VICTORIA NIAGARA FALLS PARK.

Financial Statement.

Receipts, 1905.

Ontario Power Company, rental	$30,000 00	
Canadian Niagara Power Company, rental	15,000 00	
International Railway Company, rental	10,000 00	
Electrical Development Company, rental	7,500 00	
Zybach & Company, rental	9,000 00	
Refund from Dominion Government (on account of Fort Erie monument)	3,000 00	
Tolls and sundries	1,188 30	
Wharf privileges	411 00	
		$76,099 30
Overdraft at Imperial Bank, December 30th, 1905		26,734 21
		$102,833 51

Note.—The special deposit of $25,000 made in 1903, for the maintenance of water levels at the intake of Canadian Niagara Power Company, and at joint intake of International Railway Company, and city water supply, now ammounts to $25,099.09; interest credited, amounting to $2,288.41, and $2,189.32 having been paid out on account of overflow dam constructed at city and railway intake.

Expenditures, 1905.

Paid overdraft Imperial Bank, January 1st, 1905	$22,460 50

Capital Account:

Paid wages, permanent works	$5,287 75	
" materials	4,031 62	
" completing refectory building	1,567 48	
" protecting shore and grading, etc., Upper Niagara River	7,325 38	
" acquiring lands to widen Upper Niagara River Road	1,036 54	
" acquiring frontage at Clifton House	5,001 59	
" legal expenses	836 60	
" expert engineering opinion, advice re-water powers	3,465 08	
		$28,552 04

Maintenance Account:

Paid salaries, office and official staff	$3,590 00	
" " constables and gardener	6,263 00	
" wages, laborers and teams	10,012 73	
" for materials	4,730 25	
" office expenses	246 23	
" Commissioners' expenses	729 39	
" miscellaneous	973 09	
		$26,544 69
" Interest on bonds, including bank charges		25,276 28
		$102,833 51

APPENDIX "A".

REPORT OF THE SUPERINTENDENT OF THE PARK.

To the Commissioners of the Queen Victoria Niagara Falls Park:

GENTLEMEN,—The winter of 1904-5 like its predecessor was exceptionally severe and protracted, the cold weather extending well into the spring months and causing great quantities of ice to form in the vicinity of the Falls, thus delaying the commencement of the usual cleaning up works in the park. Notwithstanding the very low temperature, recorded time and again during the winter, the shrubbery and plant life in the Park came through without injury, thus proving the exceptionally favourable conditions here found for the growth of plants of tender habit.

Like the two previous years, last year was a very active one in the park, owing to the great number of men employed in carrying on the works for the development of the water power. Notwithstanding the severity of the winter months, all these operations have been persistently pressed forward throughout the season, and very great progress has been made in each case.

As these works are all of very great importance and interest, not only in respect to their character as the most extensive and advanced mechanical power, producing plants of the present day, but also in relation to their location in the Niagara Falls Park, and the consequent effect, the works will have upon the scenic surroundings of the great cataract, they will be referred to at some length.

Canadian Niagara Power Company.

As was noted in last years report, all the hydraulic and electric works required for the installation of the first two generator units, each of 10,000 electric horse power output, were completed on 1st January, 1905, ready for the formal opening of the works of the company within the time limit fixed by the agreements made by the Commissioners; a vast amount of work, however, remained to be done in order that the three additional electrical generators needed to complete the first one-half of the total installation of electric power contemplated by this company, could be made ready, a great amount or work was also required in connection with the interior embellishment of the power house. Much of this work has been brought to a successful completion during the past season, and the company have now three of their large generators fully equipped, with all the hydraulic and electrical appliances required for the efficient control of no less than 30,000 electrical horse power; while the hydraulic apparatus for the two additional units has been installed and all the multitudinous works required to equip, regulate and control the balance of the electrical machinery is far advanced towards completion, although the generators have not yet been set up in position.

The extension of the wheelpit to the full length designed for the ultimate capacity of the works, which was in progress at last report, was carried down to its proper depth and the several side chambers required for oil, and water pumping machinery, etc., were all excavated early in the season, the interior lining of the wheelpit with brickwork set in cement, has been brought up to the full height and the numerous castings required to be set in these walls for the support of the mechanism have all been put in place. It is not the intention of company to extend the power house over this easterly one-half of the wheelpit at present. A temporary floor will, however, be put over the whole of the area, pending such time as the market for electricity will warrant the installation of additional machinery and the extension of the building being undertaken. In the meantime a temporary timber wall has been put in the portion of the power house at present completed.

Owing to the exceptionally severe weather and the very small quantity of water used by the company in the early part of the winter, ice formed very solidly in the Forebay with the result that several of the ice rack piers were damaged, these were repaired during the season and all the intake and Forebay works of the company are now in good working order.

So far the output of power by the company has been comparatively small owing in a great measure to the difficulties which have arisen in connection with the building of transmission lines by means of which a considerable part of the electric power generated at Niagara Falls will be carried from the power house in the Park, for use at points more or less remote from the Falls. As the difficulties in question relate to the carrying of high voltage copper or aluminum transmission cables have been referred of railway which must be crossed, the matters at issue have been referred to the Board of Railway Commissioners for settlement and as all the companies developing power at Niagara Falls are equally interested in securing a prompt and reasonable determination of this question, it is important that an early decision be made, otherwise the companies will be handicapped in the sale of their power.

South of the railway intake, the rock filling by which the company reclaimed a portion of the river bed has been properly faced with massive stone riprap, and the surface of the made ground has been levelled and cov-

ered over with soil, according to agreement. This work was sufficiently advanced by mid-summer to permit of the area being sown with coarse grasses, and late in the fall, quite a number of maples and elms were planted out. This whole space will be finished off with clumps of shrubbery and turf as soon as the spring opens, and the main park driveway which will be located on this reclaimed territory east of the electric railway tracks will be graded and macadamized ready for the midsummer traffic.

A heavy stone revetment wall has been constructed by the company along the edge of the cliff from the view point which for many years formed the terminus of the front walk at Table Rock, to the present edge of the Falls; the face of this wall was built a few feet back from the edge of the cliff in order to conceal the masonry behind a facing of soil, in which vines and shrubs may be planted so as to give a natural appearance to the bank at this point; the space behind the wall was filled in and brought to a proper level ready for covering over with surface soil.

It is proposed in 1906 to continue the present ornamental stone and iron panelled parapet wall, which now ends near the old elevator formerly used by visitors viewing the Falls from below, all the way to the edge of the cataract, a distance of nearly eight hundred feet, so as to afford a suitable finish to this the most important part of the park front, and at the same time provide a perfectly safe protection to the promenade which will be constructed along the whole extent of and immediately behind the parapet.

Owing to the machinery and material required for the completion of the tunnel operations of the Electrical Development Co., occupying all the space north of the Electric Railway intake, the construction of the new driveway along the river bank, south of Table Rock, which has been provided for in the new layout of the park could not be begun, it is hoped, however, to have this improvement made early in the ensuing season.

As all the heavy material required for the installation of the hydraulic works in connection with the third, fourth and fifth electrical units of this company has until recently occupied the ground west of the power house, and the contractors' plant and material have fully taken up the space to the east and south, it has not been practicable to level off or surface with soil this part of the companies' work.

The Ontario Power Company.

The Ontario Power Company, whose works required a much greater tearing up of the park surface than the combined works of the other two companies, has made splendid progress during the year with all the various and extended operations required in its undertaking, and so successfully was this done that by the end of October, the company had brought to completion nearly all its surface works in connection with its first installation of 60,000 horse power. At the extreme south end of the Park, the very extensive Forebay constructed in the bed of the river, including the intake gates and curtain walls by which the entrance of water into the Forebay is regulated the extensive screens, inner Forebay, foundations of gate house and all the various works required for the admission, regulation and control of the water for the entire requirements of the company's plant were completed in the early part of the season and the Coffer Dam was removed and the water admitted to all the upper works of the company in June last.

The eighteen feet diameter pipe line, which carries the water beneath the park surface from the inner Forebay to north of Table Rock House, was finished last year, but the immense amount of material which has been exca-

vated in order to permit of the construction of this work had not been replaced. Before this was done the exterior of the pipe was encased in concrete, the excavated material was replaced and the surface of the Park brought to the required level, the whole of the disturbed area, together with the extensive additions which had been made to the Dufferin Islands, was then levelled off and covered with good surface soil as required by the Commissioners.

The construction of the Screen House Building was carried on throughout the year and is now practically completed. It is a well designed building of Roman Stone, with wide stair-ways leading up at either end to the broad roof which has been adapted for a promenade; this promenade, which is protected on either side by handsome railings of stone and open metal work panels, will without doubt form one of the most attractive features of the Park, as it affords a broad outlook over the whole width of the river from the broad sweep of the flowing water of the upper river, through the turbulent rapids to the ever ascending column of spray which marks the position of the Horse Shoe Falls. In the immediate foreground a very fine view is afforded of the outer and inner Forebays of the Ontario Power Company, further down stream, the Forebay of the Electrical Development Company and the intake of the Canadian Niagara Power Company are well seen. On the landward side, the course of the several narrow streams which flow about the Dufferin Islands and the foliage of the banks and Islands all combine to afford a most delightful and interesting panorama.

The gate house, which is completed, is a Roman Stone structure of massive but pleasing architecture; the building contains the machinery and appliances used in raising and lowering the heavy stoney gates which control the admission of water to the pipe lines. An underground extension of the gate house at the river end, contains a battery of boilers for warming the interior of the Screen and Gate houses to prevent frazil forming on the iron work of the screens or gates. The boilers are heated by natural gas and consequently are entirely free from the annoyances, caused by smoke or coal dust.

At the northern end of the pipe line very extensive works were required for the subdivision and control of the large volume of water delivered by the eighteen-feet diameter main under a velocity of over fifteen feet per second. Separate down pipes or penstocks are used to conduct the water from this main to operate each of the electrical machines in the power house, and every penstock required a valve by which the supply could be regulated or cut off as might be desired. The penstocks are nine feet in diameter, and as the head and velocity of water are considerable, the valves were of necessity of very massive construction. A large space was therefore necessary for their installation and operation. This was accomplished by providing a long brick-lined valve chamber in the rock beneath the eghteen-feet supply main, and constructing from the surface of the Park to this chamber concrete shafts between each pair of valves in order to facilitate the renewing or repairing of the mechanism from time to time. All this extensive and costly construction has been finished, the large pipes encased in concrete, the filling and surfacing completed, and nothing remains on the surface of the Park to indicate the important works which have been constructed beneath.

In order to guard against the possibility of a sudden stoppage of the flow of water through the main pipe by lightning or otherwise, and the very serious consequences which might result therefrom, it was absolutely necessary to provide in connection with the supply pipe an automatic device which would afford prompt and efficient relief. As all the works are upon a very great scale the means ordinarily used for this purpose could not be adopted. After a

great deal of study a spillway construction was designed as a terminal for the pipe, in the form of an adjustable weir, with a spiral outflow for the waste water terminating at the front of the power house in the lower river. The principal part of this very important and extensive work has been completed, and only the exterior finish of the structure and the restoration of the grounds around the same requires attention.

In connection with the development of the plans for the restoration of the Park adjacent to the spillway, advantage has been taken of a readjustment of the plans for securing access from the Park surfce down to the power house in the lower river and also up to the transformer house and general offices of the company located on the high ground overlooking the Park, whereby the elevator portal and the spillway which are in close proximity are treated as component parts of one structure, with excellent architectural effect.

As these structures are located at the narrowest and possibly the most interesting part of the Park, their completion will remove the last evidence of the very great disturbance of the Park surface necessitated by the operations of this company.

Below the Cliff, the vast amount of work required to provide the foundations for and install the hydraulic and electric machinery for the operation and control of three complete units and the concrete foundations for three additional machines has all been done. Much of the hydraulic and electric machinery required for the fourth unit has also been delivered.

Upon the completion of the first two electrical generators with all the connecting works for the supply and regulation of the water required in their operation, very careful tests were made of the flow in the hydraulic pipes and the efficiency of the water wheels and machinery. These tests indicated that the designs secured a greater delivery of water under a less friction loss than had been assumed, and also that the efficiency of the water wheels was in excess of the requirements. It was therefore decided to increase the size of all additional generators to 12,000 instead of 10,000 electrical horsepower. This enlargement of the mechanical units will of course result in fewer machines being required, and thus reduce the ultimate length required for the power house. The interior of the concrete wall of the power house has all been lined with cream-colored tiles with ornamental relief.

Electrical Development Company.

All the works of this company both above and below the surface of the Park, have been pushed forward with great energy during the year.

The wheelpit, the excavation of which was completed by the first of the year, has been lined throughout with massive brickwork laid in cement, and two tiers of heavily armored concrete arch beams have been thrown across at various elevations to support the vertical shafting which will connect the water wheels in the bottom of the pit with the generators on the floor of the power house. These arched beams are also designed to resist the tendency of the walls of such large excavations to creep inward at certain seasons of the year.

At the top of the pit a continuous concrete arch of great strength has been built on which is carried the concrete foundations for the electric generators, each of 12,500 electric horse power capacity, the largest generators so far designed for commercial purposes. The foundations for the power house, which are of heavy concrete construction and rest upon bed rock, have all been carried up to the floor level and made ready for the superstructure. The two outer rows of arches which are to form the defences of the power station

from floating or field ice have been completed. These are constructed of substantial concrete piers and arches up to a few feet below water level, and surmounted with continuous curtain walls of very heavy masonry up to finished floor level where a broad coping of dressed limestone provides a convenient footway from which sheet ice, if formed in the forebays, may be dislodged and passed on to the river through the sluiceways in the overfall dam.

The outer wall will also be provided with substantial iron railings, and may ultimately be used as a promenade from which visitors can view the beautiful prospect of the forebay and rapids without interruption of any kind.

The deepening of the forebay has been carried on continuously; the greater part of the rock removed is being crushed for use in concrete, the balance being used for filling up to finished grade the lands reclaimed from the river and in readjusting the finished surface of the Park in the vicinity of the power house.

As early in the season as the works permitted, a beginning was made in removing the coffer-dam, constructed in the river bed to unwater the forebay and site of power station, and by the end of the year all that portion which was below the cascades had been taken away. The removal of this great coffer dam is necessarily a very slow work, as all the stone filling of the outer and inner cribs and the clay puddle between has to be recovered by dredging, and the timbers taken apart and removed from the water. The stone is of course very useful for crushing into concrete or for filling purposes, while the clay answers well for topping off the stone used in the fills. It will not be practicable to remove the coffer dam above the end of the overfall dam until the excavation of the forebay has been entirely completed and the tracks removed.

The main discharge tunnel has been completed with the exception of the concrete rings which form the lining at the portal under the Falls. This tunnel, said to be the largest in cross-section which has heretofore been constructed, is a very fine example of high-class engineering and mechanical work, and excites the admiration of visitors. The two branch tunnels, one on either side of the wheelpit, which are to receive the spent water discharged through the draft tubes after operating the water wheels, and deliver it to the main tunnel a short distance from the lower end of he wheelpit, are also practically complete and most of the corkscrew draft tubes have been put in place. All this work will be ready for the installation of the hydraulic machinery early in the spring.

Late in the autumn the heavy steel skeleton framework for the power house was begun, and already nearly two-thirds of this work has been rivetted up in place, and the track laid for the electric traveller by which the machinery required in the work will all be handled. This traveller is on the ground ready to be put together.

The Indiana limestone, of which the walls of the power house will be constructed, is all on the ground for the first section of the building—about two-thirds of the ultimate length—and most of it has been cut and made ready to be built into the work when spring opens. The stone is of very fine quality, and well adapted for high class work, the carving on the capitals of the colonnade and of the entablature of the main portico, has all been done and the stones marked and piled ready for building operations.

Owing to the continued necessity for handling materials for the tunnel through the shaft near electric railway intake, the removal of the many buildings erected by the contractors near that point, and the tidying up of the grounds has of course been delayed, and it will probably be well on in the summer before the various construction works in connection with the power

house will be far enough advanced to permit of the levelling and surfacing of the Park in that vicinity being undertaken.

Restoration of Park Surface.

Reference has already been made to the levelling and surfacing of the very extensive territory in the Park which had been disturbed by the construction operations of the Ontario Power Company extending from the new Refectory building to the southern extremity of the grounds above Dufferin Islands, and to the changes consequent upon the works of the Canadian Niagara Power Company. As soon as these works were sufficiently advanced to permit of planting operations being undertaken the whole Park force was employed in preparing the newly-made ground and in collecting and setting out a great variety of deciduous trees and shrubs, evergreens and vines, so as to cover as much of the territory as possible before winter set in. When the works for the development of power were commenced, a large collection of suitable stock for this purpose was selected at Font Hill nurseries and set aside for future requirements, and arrangements made whereby the nurserymen should give the best of attention to the care of this stock pending the completion of the works and the restoration of the grounds. Owing to this foresight over two thousand well grown, well rooted and in every way superior trees and shrubs and vines were thus obtained and set out at various places in the Park, chiefly on the newly made additions to the Dufferin Islands, and about a thousand hardy natives were collected from the woods near at hand and at Queenston Heights, and intermixed with the stock obtained from the nurseries.

As the character of the new-made ground, particularly the extensions to the Dufferin Islands, is simply a rock-dumped fill, full of interstices and incapable of holding water, the earth surfacing used was in all cases clay, upon which was spread a good coating of top-soil or sods. Notwithstanding all precautions, however, it will be a difficult matter for a year or two to secure sufficient shade to prevent the ground drying out in hot weather, the planting has therefore been made much thicker than usual, with the expectation of thinning out later on when the soil has silted down into the crevices of the stones and afforded better nourishment for the roots of the plants. A collection of very sturdy elms and maples was also obtained from nearby woods and planted at points where a strong growth was early desired, while many deciduous trees of from twenty to thirty feet in height which were found growing along the bank in rear of the Park and could be spared from their natural location were transplanted with a ball of native soil for immediate landscape effects in the vicinity of buildings and at points where screens of foliage are absolutely required.

Fortunately, the latter part of the season was very mild, which permitted of work in the open being carried on to a much later date than usual. This work of planting should be carried on throughout the coming year with vigor if the upper portion of the Park is to be brought to a finished condition without undue delay.

General Park Works.

In last year's report the necessity for a new and enlarged shelter pavilion in the picnic grounds was referred to. This work was undertaken early in the season and completed in time for the opening of the excursion travel in June. The new structure is of the same general design as the former one, but twice as long and of heavier and more permanent construction. The floor is

of concrete, and provision for the hot and cold water is made in a basement, easy of access from the grounds and equipped with natural gas heaters, thus doing away with the necessity of having a fireman constantly in attendance. The number and size of the excursions visiting the Park in 1905 were, however, more than sufficient to tax the greatly increased accommodation thus afforded, and it will be necessary to erect another building of the same general character in the spring in order to provide for the comfort and convenience of visitors.

The perennial border which extends along the foot of the hill from the picnic grounds to the jolly cut entrance to the Park, has been a source of unending delight to visitors, the constant succession of bloom, the rarity of many of the plants and the great diversity of the species calling forth much praise from all who are in any way interested in flowering plants, and reflecting very great credit on the Chief Gardener, Mr. R. Cameron. Now that the upper portion of the Park has been restored a very favorable opportunity is afforded for extending this work, as the combination of leaf mold soil and spring water there presented will permit of equally favorable results being attained in a much wider botanical field.

The northern portion of the Park was maintained in good condition throughout the season, and notwithstanding a greatly increased volume of both tourist and excursion travel, but little difficulty was experienced in maintaining order at all times. A great many Niagara Falls citizens from both sides of the river take advantage of the Park on moonlight nights to enjoy the wierdly beautiful scenery presented by the Falls, the rapids and the gorge under a subdued light, or to witness the delicate beauty of the lunar bow outlined on the clouds of ascending spray. Many others desire to enjoy the refreshing coolness of the evening atmosphere in the Park, particularly during the hot season, but are prevented from doing so owing to the darkness. It seems to me to be most desirable, therefore, that at least a portion of the Park should be furnished with electric light, say for the present that part which extends from the front entrance opposite the Clifton House southwards as far as the edge of the Falls.

If this were done doubtless very many who are closely engaged all day and have no leisure for recreation during business hours would take advantage of the opportunity for an evening stroll in the Park, and the end for which the Park was created would be fulfilled to a much higher degree.

The Mowat Gate, which is the principal entrance to the Park, was built in 1887, and is constructed entirely of rustic cedar. It is now out of repair and greatly in need of renewal. As the Victoria parkway in front of the new Clifton House has been widened considerably, it would be desirable to make a new carriage entrance nearer to the front of the Park and in a more direct line with the approach from the end of the upper steel arch bridge. By so doing a small piece of new road would be required to connect with the present driveway near the Superintendent's office, and a new gateway substituted for the Mowat Gate. This new entrance need not include a gate house, but preferably should be substantial and ornamental stone posts, two to delimit the roadway and one on either side of these for pedestrian entrances. Should this work be undertaken a new stone and metal panel fence, extending along the whole northern limit of the property on Ferry street, would be a very great improvement over the present wire fence and add greatly to the dignity and character of the Park.

Outlying Parks.

At Queenston Heights Park all the grounds were maintained in good order throughout the year. A very noticeable increase of visitors to this

famous historic ground taxed the facilities provided for their accommodation to the utmost and necessitated additional work in attending to their requirements. Extra seats and tables were provided, new paths have been constructed and a greater area of the grounds about the earthworks behind the Monument was cleared up and made accessible.

A new path was made leading down the heights from the electric railway crossing to the site of the half-moon battery made famous in the battle of October 13th, 1812, as the point from which Major-General Brock first observed the enemy to be in possession of the Heights, and a rustic viewpoint has been constructed near by. The path was continued from the battery to the steps overlooking Front street in the village of Queenston, and a connection path opened up from the same point along the roadbed of the old horse tramway which, prior to 1857, connected Queenston with Chippawa and formed the chief means of carriage for all goods passing up or down the great lakes.

The small parcel of ground about the Monument set by His Majesty the King on the occasion of his visit to Canada in 1860, to mark the spot where General Brock fell, has also been maintained in good order and condition.

At Niagara Glen some additional paths have been made, opening up new features of this very wild and interesting portion of the Park. The number of visitors to the Glen has greatly increased in recent years, and were it not for the fatigue involved in climbing up and down the cliff the numbers would be many times greater. If it were possible to provide an incline railway at this point many who are now debarred might enjoy the unique display of nature's handiwork, both geological and botanical, here displayed and the objections now made by all visitors in warm weather would be removed.

At Fort Erie, the granite shaft erected by the Dominion Government at the solicitation of the Commissioners was completed by the placing of the bronze tablets commemorating the regiments taking part in the siege and the officers who fell in action at this point in the war of 1812-14.

An imposing flagstaff was also erected. It is wholly constructed of galvanized steel, and is 100 feet in height. The ground in rear of the ruins of the Fort were ploughed up in order to remove the unevenness and will be levelled off and sown in good grass in the spring. A beginning was made in providing plantations to relieve the bareness of the grounds and some very fine maples and elms were planted.

Niagara River Boulevard.

The work of protecting the shore of the upper river from the erosive action of the water has been carried on during 1905 and over two miles in the aggregate of the worst spots have now been protected by heavy stone riprap placed along the water line. The high water caused by storms on Lake Erie which have been of requent occurrence the past few months has demonstrated the necessity of urgently prosecuting this work as long reaches of the shore which are not subject to wear at ordinary high water have given away under the abnormal conditions which have recently prevailed and in some places the waves have even surmounted the protection works but without causing much damage. Although this work is costly, owing to the difficulty of obtaining stone in the locality, yet there appears to be no other way of stopping erosion, when once it has begun, which would be as economical and as easily adapted to the requirements.

Several pieces of land have also been acquired during the year to widen out the highway along the edge of the river bank. Altogether additional

width has been secured for about one-fourth of the total distance between Chippawa and Bridgeburg. As practically the whole of the frontage will require to be widened in order to provide a suitable width for the proposed boulevard, it is desirable that this work also should be prosecuted energetically, as without doubt the value of all lands within a reasonable distance of Niagara Falls will be increased by reason of the development of the water power for electrical purposes.

All which is respectfully submitted,

JAMES WILSON,
Superintendent.

APPENDIX "B."

Copy of an Order-in-Council approved by His Honour the Lieutenant-Governor the 14th day of June, A.D. 1905.

The Committee of Council advise that L. Clarke Raymond, of the Town of Welland, Esquire, Barrister-at-Law, and Philip William Ellis, of the City of Toronto, Esquire, be appointed Commissioners for the Queen Victoria Niagara Falls Park in the room and stead of A. W. Campbell and James Bampfield, resigned.

Certified,
(Sgd.) J. LONSDALE CAPREOL,
Clerk, Executive Council.

APPENDIX "C."

QUEEN VICTORIA NIAGARA FALLS PARK.

Memorandum respecting the application of the International Railway Company to increase the output of electric energy at its power house in the Park, and to lay conduits from the power station to the upper steel arch bridge to carry the electricity without the Park.

In 1891 an agreement was entered into with a syndicate of Canadian capitalists for the construction of a line of electric railway through the Park and extending northerly to connect with Lake Ontario navigation at the Village of Queenston, and southerly to the terminus of Lake Erie navigation at Chippawa, in order to provide easy and convenient access to the Park from the larger centres of population within reach of Niagara Falls. By the terms of this agreement authority was granted to procure from the waters above the Falls the power required to operate and light the railway.

In 1892 an Act of the Legislature (55 Victoria, chapter 96) was passed incorporating the company contemplated by the agreement under the title of "The Niagara Falls Park and River Railway Company," under the provision of which Act, in addition to the right to construct an electric railway between the points named authority was granted the company to acquire stock in, or run its cars over, any street car line which might connect with the railway, and to convey the electricity required for working or lighting the railway along the public highways and across any of the waters of the Province, but the electricity so conveyed was not to be used for any other purpose than to work and light the railway.

The Act further provided that the rights granted the company should not be exercised within the limits of the Park without the consent of the Commissioners or the approval of the Lieutenant-Governor in Council. The railway was constructed without delay, and was opened for traffic in the summer of 1892.

In 1900 the Buffalo Railway Company, incorporated under the laws of the State of New York, was granted authority by the Parliament of Canada (63-64 Victoria, chapter 54) to acquire certain railway and bridge company franchises in Canada, including all the property and rights of the Niagara Falls Park and River Railway Company's railway, but the Act specifically preserved to the Commissioners all the jurisdiction and control in respect of the Park and River Railway Company, which was secured to them under the agreement of 4th December, 1891.

This Dominion Act was followed by an Act of the Provincial Legislature in 1901 (1 Edward VII., chapter 86) confirming the Dominion legislation and authorizing the Niagara Falls Park and River Railway Company to sell its franchise and property to the Buffalo Railway Company, but reserving in all respects the control and jurisdiction of the Legislature of Ontario, and of the Commissioners, over the railway, as provided by the Act of Incorporation (55 Victoria, chapter 96).

In this confirming Act, however, the original Act was amended by striking out the words "to work and light the said railway" in subsection 9 of section 4, and substituting therefor the words "the purposes of any railway company which purchases the franchise of the company."

In 1902 authority was obtained from the Parliament of Canada (2 Edward VII., chapter 43) and from the Legislature of Ontario (2 Edward VII., chapter 12, *par.* 30) to substitute the name International Railway Company for the Buffalo Railway Company, in each instance the powers and rights of the Legislature, and the jurisdiction and control of the Park Commissioners, were again specifically reserved.

In October, 1903, the International Railway Company applied to the Commissioners for approval of certain plans showing a line of conduits beneath the surface of the Park in which to carry electric cables from the railway power house to the upper steel arch bridge. Upon enquiry it was ascertained that the conduits were wanted for a two-fold purpose, namely: to protect the wires, carrying electricity for operating the railway, from ice and spray in the vicinity of the Falls; and, secondly, to carry electric power to the American side of the Niagara River to operate in whole or in part the extensive electric railway system of the company in the State of New York.

As the demand of the company to use power generated in its power house in the Park for operating railways outside of Ontario was an entirely new feature of the case to the Commissioners, and as it opened up important questions of policy which would sooner or later require the attention of the Government, the Commissioners obtained opinion of counsel as to the rights possessed by the company under its Act of Incorporation and the amending Acts subsequently passed by the Parliaments of Canada and of Ontario, which differed entirely from the views of the railway company.

A long controversy followed, in which eminent counsel took diverse views of the question at issue, which was further complicated and delayed by the difficulty experienced in securing the consent of the several power companies developing the water power of the Falls for commercial purposes.

After a protracted discussion of the question, in which it was apparent that the conflicting opinions of counsel could not be reconciled, the Government requested the Commissioners to prepare a recommendation which would embody the views of the Board as to a just and reasonable compromise of the

matters in question; after due consideration and consultation with the Premier, the Commissioners, in May, 1904, submitted their recommendation which was in the following terms:

(*a*) That the company shall pay to the Commissioners annually $2,000 in addition to the $10,000 now paid as rental, which payment of $2,000 will allow the company to generate within its power house in the Park for the purpose of supplying any quantity of electric power up to 2,000 h.p., and for every horse power over and above 2,000 horse power the company shall pay to the Commissioners the additional sum of one dollar per electrical horse power per annum.

(*b*) That the power so supplied shall be used exclusively for the purposes of operating and lighting the railway, and for no other purpose whatever.

(*c*) That the company shall be restricted in the generation of power to the present capacity of their forebay, wheelpit and tunnel in the Park, and not in any case to exceed 10,000 electrical horse power.

(*d*) Such grant and concession to the International Railway Company not to be operative unless the consent of the three power companies now located at Niagara Falls, Ontario, be duly obtained.

(*e*) The Commissioners may agree that, at the next Session of the Legislature, or as soon as practicable, they will join the International Railway Company in an application to the said Legislature for any Act to ratify and confirm an agreement to be made pursuant to preceding stipulations, and with proper stipulations to carry out the same."

In making these recommendations the Commissioners assumed that 2,000 electrical horse power would be sufficient for the actual requirements of the railway operated by the company under its agreement with the Commissioners, and that the company should pay a reasonable rental for all excess power substantially on the principle adopted in the several agreements entered into with the companies developing the water power of the Falls for commercial purposes. And as the company claimed they required the power for railway purposes only, it was deemed but just to the commercial power corporations that in any agreement entered into with the railway company the use of the power generated by it should be restricted to the use of the railway.

It was also considered advisable in order to avoid possible disagreement with the power companies that their consent should be obtained to any agreement which might be entered into with the railway company.

As the terms and conditions set forth in this recommendation of the Commissioners were not acceptable to the railway company, objection being made chiefly in respect to clause (*c*) limiting the total output of power to 10,000 electrical horse power, which the Commissioners were advised was the maximum amount of power which could be developed by the company through its present intake, forebay and tunnel the question remained in abeyance until recently when the company renewed its demand for permission to construct the conduit through the Park to generate additional power for operating its railway in New York State.

Some changes having in the meantime taken place in the personnel of the Commission, all the questions at issue were again examined by the Board, and all the correspondence, reports and papers in connection with the case were submitted to the Attorey-General, who, after due consideration directed the Commissioners to formally notify the company that the application could not be acceded to, which notification was duly served upon the company through its solicitor on 7th October last.

The company have, however, urged a reconsideration of their application before the Government, and, therefore, the Commissioners have been

invited to review all the circumstances of the case and to report fully thereupon for the information of His Honour the Lieutenant-Governor in Council.

After a most careful consideration of every phase of the question, and having regard to the great desirability of coming to an equitable compromise without recourse to litigation, the Commissioners recommend (subject to the settlement of any constitutional questions which may arise) that the terms and conditions submitted by them in May, 1904, be amended to read as follows:

(*a*) The company shall pay to the Commissioners annually, in addition to the sum of $10,000 now paid under their agreement, the sum of $2,000 for which increased payment the company may generate in its power house in the park electric power up to but not exceeding 4,000 horse power.

(*b*) For a further payment of $1.00 per horse power per annum the company may generate and use any quantity of electric power over 4,000 horse power up to but not exceeding ten thousand horse power.

(*c*) Should the railway company, with the approval of the Commissioners, deepen their wheelpit and construct a tunnel at a lower level so as to generate a greater quantity of electric power than 10,000 horse power with the present capacity of their intake by using the water at a greater head, the company shall pay to the Commissioners the sum of seventy-five cents for every horse power so generated and used for railway purposes in excess of 10,000 electric horse power, but under no circumstances shall the railway company be permitted to generate or use more than 20,000 electrical horse power.

(*d*) The company shall obtain the consent under seal of the three power companies now located in the Park, and, as the International Railway Company applied for and obtained permission to have a joint intake with the City of Niagara Falls for its water supply, the consent of the city authorities of Niagara Falls shall also be obtained under seal.

(*e*) That the power so generated shall be used exclusively for the purposes of operating and lighting railways, and for no other purpose whatever.

(Sgd.) J. W. LANGMUIR,
Chairman.

TORONTO, January 4th, 1906.

APPENDIX "D."

REPORT OF THE PARK SUPERINTENDENT IN THE PROPOSAL TO CONSTRUCT A DAM AT THE OUTLET OF LAKE ERIE.

To the Commissioners of the Queen Victoria Niagara Falls Park.

NIAGARA FALLS, 24th August, 1905.

GENTLEMEN,—The International Waterways Commission, which has been appointed by the Governments of Canada and the United States to examine into and report upon all questions arising out of the joint waterways along the boundary line separating the two countries, has appointed the 13th and 14th of September next for the consideration of the proposal made some years ago to erect a dam across the outlet of Lake Erie between Buffalo and Fort Erie for the purpose of raising the surface of the lake to a fixed stage

of water level, and of constructing regulating sluices in the dam to permit of maintaining this proposed fixed stage at all times during the season of navigation.

As this proposed work, if carried out, would in my judgment have a very important bearing upon the supply of water to the Niagara River, below the dam, and would in all probability materially affect not only the riparian rights of the Commissioners along the bank of the river but also the supply of water to the hydro-electric industries licensed by the Commissioners to use the waters of the river at Niagara Falls for power purposes, I have prepared the following report upon the subject for the consideration of the Board.

Lake Erie is the fourth in the chain of five great inland waters through which the drainage of a large portion of the continent is passed on to the sea, and whose broad surfaces temper the heat of summer and the cold of winter and furnish the moisture required to irrigate a large district of country, the size, drainage, area and run off of these several lakes being approximately as follows:

Name.	Area of water surface sq. miles.	Watershed sq. miles.*	Maximum depth.	Average run off feet per sec.
Lake Superior	32,000	48,600	1,030	72,000
Lake Michigan	22,400	45,700	1,000	
Lake Huron	23,200	52,100	1,000	190,000
Lake Erie	10,000	24,500	84	220,000
Lake Ontario	7,500	25,500	500	250,000

*According to the 1904 report of the Chief of Engineers, U. S. Army, the drainage area of the lake region above Niagara River is 254,708 square miles.

As is shown by the above table, the outflow or runoff from Lake Erie as determined by taking a mean or average for a period of many years is 220,000 cubic feet per second, or 82,500,000 gallons per minute. Owing, however, to several causes this outflow is by no means uniform, the volume varying from hour to hour with the constantly changing elevation of the surface of the lake at the outlet. The causes of this variation are:

1. The precipitation and evaporation over the lake area which uniformly gives high water in mid-summer and low water in mid-winter.

2. A periodic variation which may be traced to a cycle of wet and dry seasons, extending over a period of years, this variation is in harmony with and emphasises the general annual movement.

3. Wind storms upon the lake; while the effect is of short duration the surface of the water may be raised or lowered in a very short time to the extent of several feet, a southwest wind driving the water down the lake and piling it up at the outlet, and a northeast wind forcing the water up the lake and thus lowering the level at the outlet.

So great have been the effects of the wind at times that the surface elevation at Buffalo has been raised as much as 8 feet above the normal, while on other occasions, the level has been lowered from 5 to 5½ feet below mean water level.

Under these circumstances it would appear that if the outflow could be made more uniform it would be highly beneficial to all interests con-

cerned. The problem, however, is one of great magnitude, and requires very careful consideration in order that all the phases of the question may be taken into account. Fortunately, this subject was under consideration in 1900 and a very exhaustive and carefully prepared report was made by a Commission of Engineers for the United States Government upon the subject, in connection with other proposed works for the improvement of the navigation of the upper lakes, and although the present International Waterways Commission are not in any way committed to the plan then devised and which was fully considered and illustrated in the report referred to, yet it furnishes an excellent example of the method and scope which the best engineering opinion of the day would be likely to suggest for a work designed to accomplish the desired end, and therefore will be here referred to in order to ascertain the effect which such a system of regulation would have upon the waters of the river below the site of the works, and consequently upon the levels and supply which would be available for the navigation of the river between the lake and Chippawa as well as for the important industries which have been established at Niagara Falls on both sides of the river for the development of electricity for commercial purposes.

In so far as regulating and maintaining the levels of Lake Erie is concerned, there can be little question respecting the beneficial results which would follow from the construction of the projected works and were this the only question involved the proposal would meet with very general approval. As, however, the project has a wider influence, it will be better to briefly describe the works designed for this point.

The regulating works proposed by the U. S. Deep Waterways Commission in 1900 provided for the construction of a concrete masonry overfall dam running out at right angles to the Canadian shore of the river from a point a little over a mile up stream from the ferry landing in the village of Fort Erie. This dam to extend out into the river for a distance of 1,600 feet from which point a system of masonry piers and moveable steel gates extended a further distance of 1,210 feet, consisting of thirteen openings of 80 feet clear span, separated by piers twelve feet in thickness with grooves for the heavy moveable stoney gates. Steel towers were designed to be erected over each pier to carry the lattice overhead work and machinery for the raising and lowering of the gates. Beyond this regulation system of works, it was proposed to utilize an existing reef of rock of the same elevation as the overflow dam to carry the work to Black Rock harbor, the latter part being at an angle of 35 degrees with the main portion of the work, and 1,200 feet in length.

Under this scheme the free navigation of the river would cease and all vessels would require to use the upper reach of the Erie Canal in order to pass the proposed works, no lock having been provided for the Canadian side.

The top or crest of the overfall dam on the Canadian side and the surface of the reef on the Buffalo side of the regulating gates was fixed at an elevation of 4.5 feet below the present mean water level of the lake. The construction of the works were designed to raise and maintain the mean level of the lake 2.1 feet higher than at present.

At the established normal stage of the lake, or within the range of monthly mean stages, or at any higher water level, the regulation could be made effective and that without changing the flow of the river to any material extent, but as has already been pointed out there are seasons when storms raise or lower the water surface abnormally, and it is at periods when low water prevails that the volume of water passing the works would be reduced to small dimensions, or, possibly if the low water period occurred during the

season of navigation the supply might be cut down to such an extent as to make all use of the river impossible for navigation or in fact for any purpose to compel the closing down of all the works for the generation of electricity, which are located along the course of the Niagara River, until the storm abated and normal conditions were restored.

From an examination of the fluctuations of the lake for a period of years, it appears that the average monthly minimum level of the surface is over two feet below the established mean, while on many occasions the water surface falls much below this, in several instances to five feet and on one occasion to 5.6 feet below the normal.

Doubtless the force of the wind would be felt to quite the same extent upon the regulated level, which would be two feet higher than at present, and a study of the resulting effect upon the outflow after the completion of the proposed works leads to the following general conclusions:

At the mean monthly minimum stage referred to, with all the gates open, the outflow would be about eight-tenths of the established mean flow, and, with the gates all closed, only about four-tenths of the normal flow.

While at times of extreme low water caused by northeast winds, such as occurred in February, 1894 (when the lake at Buffalo fell 5.6 feet below mean level), there would be only one foot of head upon the overfall dam and the length of crest would also be reduced.

Under such conditions, with all the gates open, there would be only about one-third of the normal flow from lake to river pass the works, instead of fully one-half the normal as would be the case under similar conditions of exceptional low water with a free and unobstructed river. Should the gates be all closed, the flow would be restricted to only about one-twentieth of its mean volume. If this minimum elevation should happen at any time during the season of navigation, the shipping interests would of course use every effort to have the gates kept closed in order to secure the restoration of the levels of Buffalo harbor as quickly as possible after the storm abated, and as the shipping interests form a very powerful combination, and are likely to increase in importance, it is altogether likely that the gates would be kept closed, and the Niagara River allowed to run practically dry for the time being.

It is needless to point out that such an interference with the natural condition of affairs should not be permitted under any circumstances, particularly when the whole object of the scheme appears to be to save dredging the harbors on Lake Erie and to facilitate the making of a 21 foot channel from the United States side of the Niagara River to Lake Huron, the cost of which, according to Deep Waterways Commission report before referred to, would be, if the water was raised in Lake Erie, to the extent proposed, about $1,375,000 less than would be required should the conditions be allowed to remain as they now are.

I might be permitted to point out that already, owing to the construction of the Chicago Drainage Canal, the water surface of Lake Erie has been permanently lowered according to the report of the Chief of Engineers, U. S. Army, by about 4½ inches and the volume of the Niagara River has been permanently reduced to the extent of four and a half per cent. of its average yearly flow, and all the waters from Lake Huron via the St. Lawrence to the sea have been likewise despoiled to this extent for the benefit of the City of Chicago alone.

It is now proposed to further sacrifice the waters of the Niagara River and Falls by making them subordinate to the navigation interests on the upper lakes, to cut off the free use of the Niagara River by Canadian shipping, and compel it to pass by way of the Erie Canal, which is State owned

and not under the control of the Central Government, and to further jeopardise the flow down the St. Lawrence at seasons when inland and ocean navigation is in the greatest need of all the water which can possibly be had.

For all these reasons I am of the opinion that every effort should be put forth to oppose the erection of any such works at the outlet of Lake Erie as the dam and gates proposed by the U. S. Deep Waterways Commission.

Yours very truly,

(Sgd.) JAMES WILSON,
Superintendent.

REPORT

OF THE

Minister of Public Works

FOR THE

PROVINCE OF ONTARIO

FOR THE

YEAR ENDING 31st DECEMBER

1905

PRINTED BY ORDER OF
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FOR THE YEAR ENDING 31st DECEMBER, 1905

To His Honor WM. MORTIMER CLARK, K.C.,
Lieutenant-Governor of the Province of Ontario, etc.

As required by the provisions of the statute in that behalf, I beg to submit the reports of the Departmental Architect, Engineer, Superintendent of Colonization Roads and the Accountant and Law Clerk for the year 1905.

The report of the Architect gives details of the works in connection with the maintenance of the Legislative and Departmental Buildings, and of the construction, and completion of additions to the buildings at the several Public Institutions, and other Provincial Buildings under capital account.

The report of the Engineer contains details of the work at the several reserve dams; timber dams and slides and swing and fixed bridges crossing same; the blasting, dredging and improving channels of navigation, and clearing and dredging streams, etc.; and tabulated statement showing the mileage of completed railways and the number of miles now under construction.

The report of the Superintendent of Colonization Roads gives details of the works, etc., in connection with the building and repairs to colonization and mining roads during the year 1905.

The Accountant's Statement No. 1 shows the expenditure on maintenance and repairs account for Government and departmental buildings, institutions, etc., for the year 1905; Statement No. 2 shows the expenditure on capital account for public buildings and works, roads, railways, etc., for the year 1905; Statement No. 3 shows the total expenditure on capital account for public buildings and works, roads, railways, etc., from the 1st of July, 1867 to the 31st December, 1905; and No. 4 is a classified statement showing (a) the expenditure for four years and six months from 1st July, 1867, to 31st December, 1871; (b) the expenditure for thirty-four years from the 1st January, 1872, to 31st December, 1905, and (c) the grand total of expenditure from 1st July, 1867, to 31st December, 1905.

The Law Clerk's Statement No. 5 shows the several contracts and bonds entered into during the year 1905.

Respectfully submitted,

J. O. REAUME,
Minister.

Department of Public Works, Ontario,
February, 1906.

REPORT OF THE ARCHITECT.

To the Hon. J. O. Reaume,
Minister of Public Works, Ontario.

Sir,—I herewith submit my annual report on the work done during the past year by the Architect's Branch of the Department of Public Works.

Government House.

Ordinary repairs have been attended to in connection with the buildings, heating plant, etc., and the buildings and grounds kept in good condition generally. The old green-house and potting-shed in connection with the conservatories, which were constructed when the present Government House was erected in 1879 and which were in danger of falling, had to be rebuilt. The work was done at a moderate expenditure. As great inconvenience and annoyance has been occasioned during the past two years through the electric lights failing and at times going out during a social or state function, to obviate this state of affairs and prevent a possibility of a re-occurrence, a connection has been made with the circuit on King St. so that in case of accident to the circuit on Wellington St., the system can be switched on to the King St. circuit. The work was done by the Toronto Electric Light Co. Furniture has been supplied when found to be necessary.

Parliament Buildings.

Alterations have been made in the westerly intermediate portion on the upper floor over the reading room by lowering the ceiling of the latter about three feet, thus giving two large offices over same in the roof space, and which, if anything, has improved the appearance of the reading room. Five other large offices have been fitted up in the west wing in the roof space with an approach by a short staircase from the main corridor on the upper floor. The walls of the interior of some of the offices in the building have been painted. Furniture and fixtures have been supplied to the Departments as provided for in the estimates for the past year. More than ordinary repairs have been made to the slating, galvanized iron and copper work on the roofs, which were made necessary by the severe weather and heavy snow falls of last winter. Repairs to the heating and plumbing plants have been attended to. Repairs were made to the elevators and further repairs are now being made, which will leave them in first-class order for some time to come. The building throughout has been kept in good order from basement to roof, showing evidence at all times of the attention paid to the cleaning, etc., by the housekeeping staff. The heating apparatus in the plant house, for which an appropriation was made in the estimates, has been remodelled and improved. The grounds and roads surrounding the buildings have been well looked after. A monument has been erected to the late Sir Oliver Mowat on a site selected by the present Government in front of the end of the west wing, to the south of the buildings; from the design of Mr. Walter Allward, the Canadian Sculptor, and is composed of a pedestal 13 feet in height built of Stanstead granite with bas relief panels of bronze on the east and west sides and surmounted by a statute in bronze of the late statesman 9 feet in height. The monument is another tribute to the skill of the sculptor's art, both in conception and execution.

TORONTO ASYLUM.

Repairs to the exterior of the building only, were attended to by the Public Works Department. Extensive repairs had to be made to the galvanized iron work and slating of the roof of the main building, upon which, for some years, only temporary repairs were made as were absolutely necessary. The severe weather of the past two winters about ended the life of a large quantity of the slates, which were crumbling away and had to be renewed; as also most of the galvanized iron gutters and flashings. This work was absolutely necessary to make the place habitable.

Two new hot water heating boilers were purchased for the main building to replace old boilers. Other repairs were attended to including the fitting up of the Medical Superintendent's residence, to put the house in a sanitary condition, including painting, papering and renewing of plumbing; no work of any account having been done to the interior of the building for a long time.

MIMICO ASYLUM.

Repairs were made to the intake pipe in the lake in connection with the water supply of the Instituton. Further work along this line will have to be attended to next season. Underfeed stokers have been applied to two of the boilers in the main boiler house with a view of saving coal; the work was done under contract by the Jones Underfeed Stoker Co. Repairs have been made to the boilers as required. Other works in connection with repairs to this institution have been attended to.

LONDON ASYLUM.

A concrete pavement has been laid for a distance of 2,000 feet on Dundas street in front of the Asylum grounds. The work was done under the superintendence of the City Engineer of London. Repairs were made to the roofs and eaves on all of the buildings when they required attention. A balcony has been built at the end of the corridor on the men's side of the main building on both floors similar to the balcony erected on the women's side last year, arranged so that they can be used as sun rooms in winter by enclosing them with sashes. Both balconies have been encased with wire gratings to prevent the patients from injuring themselves. An addition has been built to the coal vault, in connection with the infirmary building, of sufficient capacity to hold the whole of the season's coal required for the building. Two new hot water heating boilers have been purchased for the east boiler house to replace two old ones.

HAMILTON ASYLUM.

Repairs have been made to the main sewer running down the side of the mountain, and connecting with the city sewer. The tiles, where broken, have been renewed. It is proposed to make more extensive repairs to the sewer next year, substituting iron pipe for the tile; as at present there is always danger of the sewer being shifted and broken by landslides, especially in the spring, and overflowing on the ground and creating a nuisance to the residents residing in the vicinity. I would recommend replacing same with iron pipe to make the work permanent.

The skating and curling rink, the work on which was commenced last fall, has been completed and is now in use. Repairs have been made to the

slating and galvanized iron work to the roofs of the various buildings. The steps, in front of the main building, down the face of the mountain, which were considered to be unsafe, have been repaired and renewed where necessary. Other repairs to the building have been attended to. Considerable repairs were made to the boilers, including the installing of a new set of grate bars to No. 1 boiler in Orchard House. As the old stack in the east boiler house in the main building was found to be too small and set too low to give sufficient draught, it was removed and a wrought iron stack erected of the necessary area and set at the proper height and covered with asbestos.

Cobourg Asylum.

All of the contracts for the erection of a residence for the Medical Superintendent were completed in the beginning of the year. The contract for electric lighting and wiring was executed by the Keith & Fitzsimons Co. of Toronto, to whom the contract was awarded after tenders had been duly called for. The grounds around the premises have been properly graded and sodded; walks laid, and the lot enclosed with suitable fencing; 80 rods of wire fencing have been erected on the south and east boundary line of the property in place of the old wooden fence, which was in a delapidated condition. Underfeed stokers have been installed in the two steam heating boilers in the main boiler house with a view to saving in coal. The work was done under contract by the Jones Underfeed Stoker Co. Alterations were made to the coal vault to make room for the engine by which this apparatus is operated.

Brockville Asylum.

The work in connection with the extension and improvements to the eaves of the roof of the main building to prevent the brick walls being damaged by leakage and overflow from the gutters and which was stopped when the cold weather set in, was completed early in the season.

Fittings were supplied to the laundry. About the usual amount of repairs were made to the brickwork, a portion of which has to be renewed from year to year. Extensive repairs were made to the piggery which was much the worse from wear and tear. Repairs were made to the boilers from time to time as were found to be necessary. As the heating plants in the cottages are not satisfactory, owing to the insufficient boiler capacity, it is proposed to improve the systems by doubling up the present boilers in three of the cottages and putting larger boilers in the other three.

Kingston Asylum.

Early in the season a cottage pavillion was erected for convalescent patients, fitted up with approved lavatory fittings, etc. of modern design. External repairs were made to the main building, consisting of repairs to slating and galvanized iron work of the roofs, and brickwork of walls and chimneys. Improvements were made in boiler connections and the necessary repairs made to boilers, including a new set of grate bars to No. 3 boiler. Repairs were made to the machinery in the laundry building; some of these machines are old and should be renewed. Repairs were made to the wharf and further repairs will have to be made next year, including the crib work to the breakwater along the water front. The electric light plant, which was installed in 1899, is in good order and working satisfac-

Asylum for Epileptics, Woodstock. Cottage "A." (Cottage "B" same as Cottage "A.")

Asylum for Epileptics, Woodstock.

torily and has proved a great convenience and an improvement in the lighting, which was formerly done by gas, but as the wiring has been extended to some of the out buildings and should be extended to others it will be necessary, in the near future, to increase the plant for supplying current.

Woodstock Asylum.

The works in connection with the erection of the two cottages and the Administration building have been completed, including the electric lighting and power, the contracts for same having been satisfactorily executed by the City of Woodstock Electric Light Co., under the supervision of Mr. J. G. Archibold, the company's Inspector. Arrangements have been made with the City of Woodstock for supplying water from their system to the institution, and an eight inch cast iron main has been laid by contractor J. A. McIntosh, connected with the city's main at Oxford and Brant Streets, with 6x3 inch branches to each of the buildings, which will be ample for fire protection and domestic purposes when the institution shall have attained its full growth. Tenders were called for and the work awarded to the above contractor, who has completed his contract satisfactorily. Drains have been laid in connection with the sewage plant, which will be completed next year, from each of the buildings. The laying of the water mains and sewage pipes was done under the direction of Mr. R. P. Fairbairn, Chief Engineer of the Public Works Department. Temporary board walks have been laid from the main buildings and cottages, which will be removed in the spring and permanent cement walks laid. The materials from the temporary walks will be used in the additional buildings.

Normal and Model Schools, Ottawa.

Fixtures and furnishings have been supplied to two of the class rooms in the Model School. The walls and ceilings of some of the class rooms were painted. Repairs were made to the buildings where required and the planking in the girls' play yard on the north side renewed, the work was done under contract by T. A. Shore, of Ottawa. Owing to the greater part of it being decayed and beyond repair, it will be necessary to renew the planking on the boys' side next year. Repairs were made to the heating and plumbing plant; much of the latter will have to be renewed next year to put it in a thoroughly sanitary condition and should receive considerable additions in the way of lavatories and drinking fountains for the convenience of the pupils. An amount was put in the estimates last year for this work, but owing to the condition of the plumbing trade it was impossible to secure satisfactory tenders, and the work had to be deferred until next year.

Normal and Model Schools, Toronto.

Repairs have been made to the buildings. The roof over the theatre in the Education Department Building has been covered with galvanized iron and painted two coats; the old roof having been found to be beyond repairing. The ceiling of the drill hall in the Model School the plaster of which was in danger of falling, has been covered with sheet steel and the hall painted throughout. It will be necessary to cover some of the other ceilings, which are showing signs of giving way, in this building in the coming year. Considerable painting and papering has been

done in some of the class rooms and passages. A manhole has been built with tile drains to same for surface drainage of the grounds at the north east angle of the Normal School. Cement sidewalks have been laid on Victoria, Gerrard and Gould streets; the work was done by the city; the Government paying a proportion of the cost thereof.

London Normal School.

Repairs have been made when necessary and furniture supplied as required. The grounds surrounding this building have been kept in exceptionally good order and have added not a little to the attractive appearance of this part of the city.

Deaf and Dumb Institute.

A large amount of work has been done at this Institution, consisting mainly of repairs. Maple floors have been laid in the boys' sitting-room and the hallways leading thereto. The ceilings, from which the plaster was falling in the official dining-room, Bursar's office, printing office and bakery, have been covered with sheet steel and the walls re-papered and painted. A large range has been installed in the kitchen to take the place of the old one, which was used up. Electric fans have been placed in the kitchen and laundry and have considerably reduced the temperature of these rooms. The cold storage room in the basement has been refitted and a new cement floor laid in same; a new refrigerator 4'0'' x 10'0'' x 9'0'' has been installed and is giving good satisfaction. The old gates and fence to the main entrance in front of the grounds which was decayed and falling down has been removed and new gates and fence of a more modern design, in keeping with the buildings and surroundings, has been erected. A very necessary improvement has been made to the cottages occupied by the engineer and carpenter of the Institution by laying tile drains from the cellars to the main road in front of the buildings. The old board fence at the rear end of the farm 850 feet in length, which was beyond repairing, has been removed and a wire fence erected in place of it. External repairs have been made to the buildings, including repairs to the tower and roof of the main building. In all cases where practicable, the work was let by contract. Furniture has also been supplied as required. Repairs have been made to the boilers, heating and plumbing plant; the work being done by the engineer of the Institution.

Blind Institute, Brantford.

Repairs have been attended to where necessary. Improvements have been made to the floors of the lavatories by laying slate slabs in place of the cement and properly drained. The work was done by the engineer of the Institution and his assistants during the vacation. 2,852 square feet of cement walks have been laid. The work was done by the Brantford Building and Paving Co. of Brantford, to whom the contract was awarded after tenders were duly called for. 130 feet of wire fencing was erected on the boundary line on the east side of the grounds.

Penetang Asylum.

General repairs and renovating the buildings formerly used in connection with the Reformatory were continued during the season. A new greenhouse has been erected 22 ft. in width by 100 ft. in length. The plans

were prepared in this Department and the work done under the Superintendent of the Asylum. The building is of the latest style of green-house construction, with iron posts and ties and complete ventilating apparatus. The steam heating was done by the engineer of the Institution. Some improvements have been made in the wards in the main building by the erection of dividing screens. A large amount of work has been done by the patients in the laying of roads, grading of grounds, and has materially added to the appearance of the place.

Orillia Asylum.

Improvements have been made in the boiler house. The wooden beams and posts supporting the roof of the addition have been removed and an iron column and steel beams put in their places. The work was done by the engineer and an assistant. Repairs were made to the roofs and other repairs were attended to, including repairs to boilers and engines.

Mercer Reformatory.

Ordinary repairs were made to the buildings, including the renovating of the gardener's house, which was in an unsanitary condition. The house has been painted and papered throughout. Repairs were made to the plumbing and new fixtures supplied where necessary. Other work in connection with the Institution has been done under the Provincial Secretary's Department.

Central Prison.

An electric light apparatus has been installed by the Canadian General Electric Co., to whom the contract was awarded after tenders had been duly called for. The installation included a 60 K.W generator complete, with two panel switchboard and engine. The work has been well done and the apparatus is working satisfactorily. Underfeed stokers have been applied to two of the boilers in the east boiler house and to two in the south boiler house with the intention of saving fuel and to consume the smoke from the furnaces.

Ontario Agricultural College, Guelph.

Tenders were called for and the contract awarded to Mr. S. F. Whitham, contractor, of Brantford, for the building of the farm mechanics' building and for two cottages for farm foremen. The work has been commenced on the foundation of the farm mechanics' building and the cottages have been roofed in and will be completed about the 1st of March.

The farm mechanics' building is an extensive structure, which will give ample accommodation for manual training, farm implements and demonstrations. The dimensions on the ground line being 147 x 64 ft. It will be three stories in height, including the basement. The foundations will be built of stone and the superstructure of brick and stone. The floors will be supported by steel beams and iron columns and the ceilings covered with sheet steel. The west wing will be occupied as a Manual Training School with metal-working rooms, modelling and drawing-rooms; the former being located in the basement and on the ground floor and the latter on the upper floor. Suitable offices have been provided for the staff in this portion of the building. The central part of the building is entirely devoted to machinery: the basement being for the storage of farm implements and the ground

floor for demonstration purposes, training, etc., along this line. The upper floor will be used for woodworking. All in connection with the school work. The east wing will contain in the basement, room for the storage of lumber to be used in connection with repairs, etc., a blacksmith's shop and a wheelwright's shop and a paint shop. The ground and upper floors in this wing are divided into a carpenter shop and woodworking rooms. The building will be finished and equipped before the end of next season.

School of Practical Science.

Chemistry and Mining Building.—The whole of the contracts for the equipment of this building, which were awarded last year, have been completed, including the furnishing of the laboratories, class rooms, etc. for the chemistry and mining section, electrochemical section and for geology and mineralogy, which were all completed early in the season. The contract for plumbing for additional equipments in the electrochemical section was awarded to Messrs. Fiddes & Hogarth after tenders had been duly received. The contract has been completed. All of the other contracts have been completed with the exception of the contracts for heating and ventilation, which are all finished with the exception of some minor adjustments in connection with electrical work.

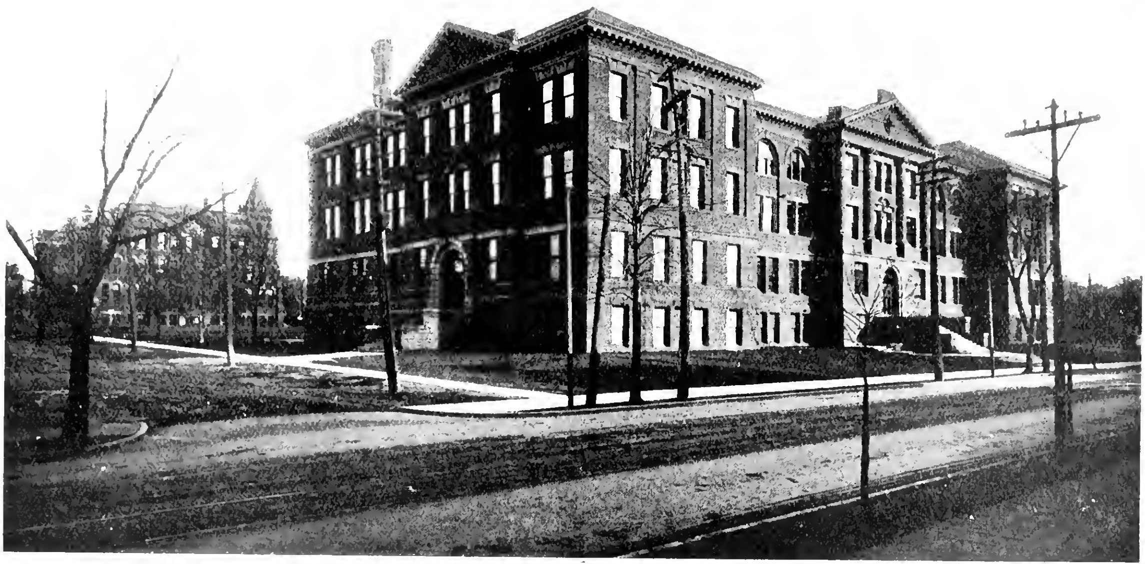
Engineering Building.—Important alterations were made to the old School of Science, now known as the engineering building. The class rooms and laboratories, formerly occupied by the chemical department, which have been transferred to the new building, have been converted into drafting rooms and suitably fitted up. A room has also been fitted up for the Professor in Architecture. The rooms in the basement, formerly used for assay work, which have been transferred to the new building, have been converted into laboratories, etc for electrical work. New floors were laid and the walls and ceilings painted. The walls and ceilings of the hallways and some of the rooms occupied as offices by the staff, were also painted. Additional heating was put in the basement in the rooms formerly occupied for milling work, which has been transferred to the new building. Repairs have been made to the plumbing work throughout the building and new plumbing put in where necessary. The work being done by the Plumbing Department of the Public Works. The whole of the work was fully completed at a moderate cost in time for the re-opening of the school on October 1st. A small frame and plaster building for an observatory to be used in connection with the study of Geodescy, has been erected on the grounds to the south of the Engineering Building and is so constructed that at a small expense it can be moved to another site if desired. The work was done under contract after tenders were duly called for.

Muskoka District.

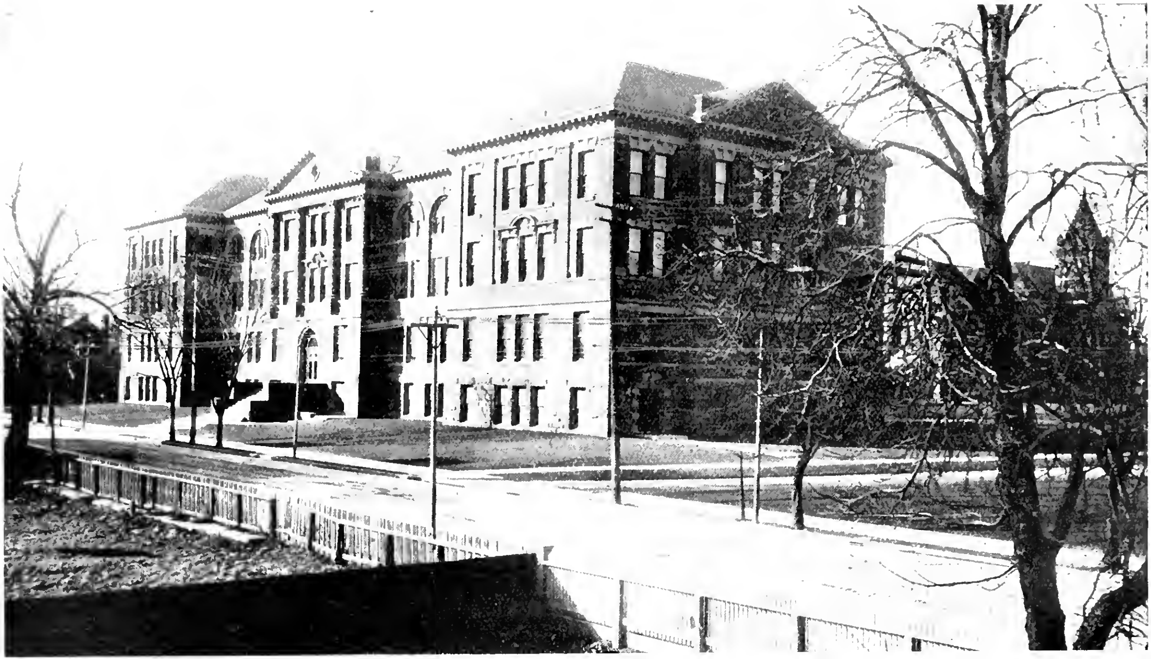
Some slight repairs were made to the Court House and Goal at Bracebridge; also to the Registry Office at the same place.

Parry Sound District.

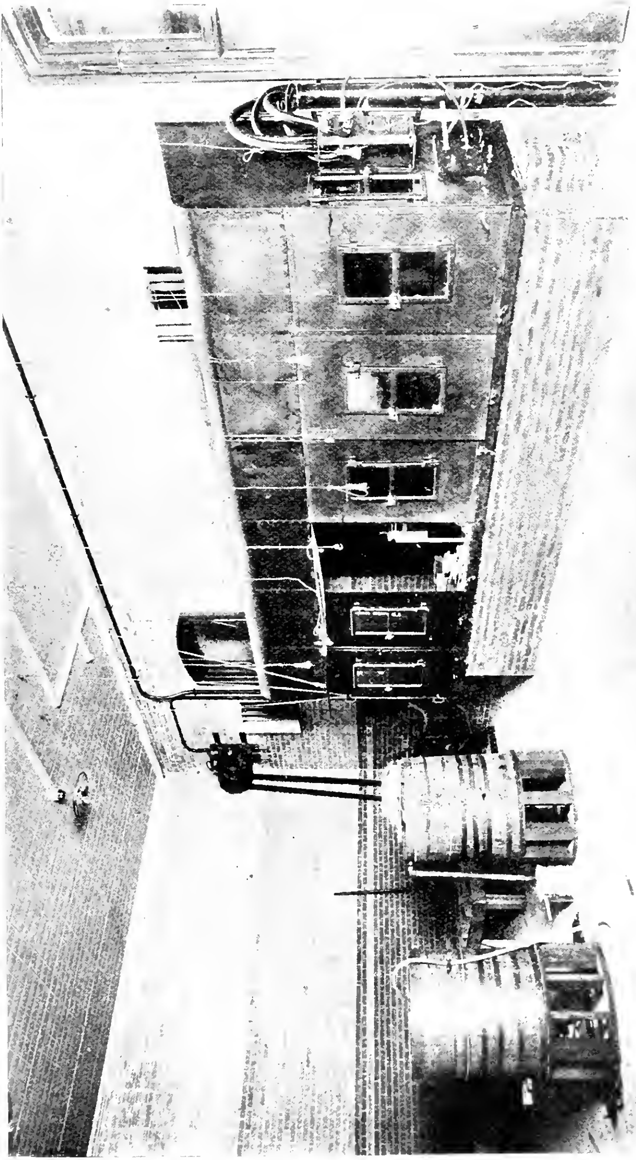
The roof of the Court House has been re-shingled, and general repairs to Court House and Goal have been attended to. The fence in front of the Court House has been re-built with stone. Repairs were made to the Court House and Goal at Burk's Falls as were needed.



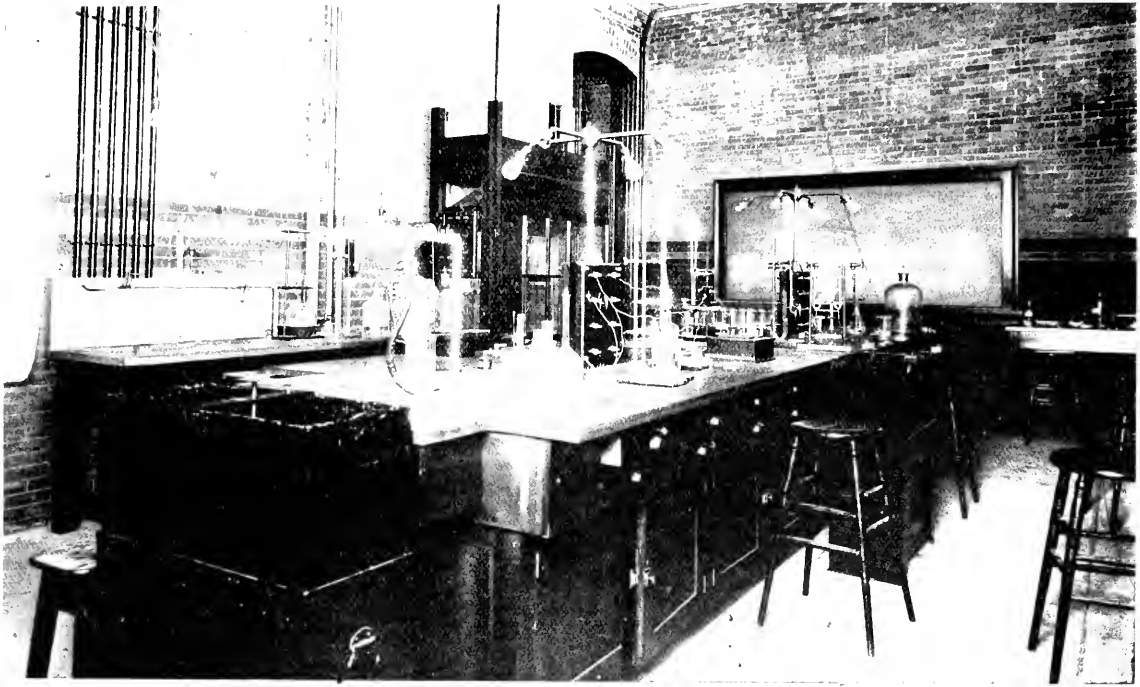
S. P. S. Chemistry and Mining Building—View from the Southwest.



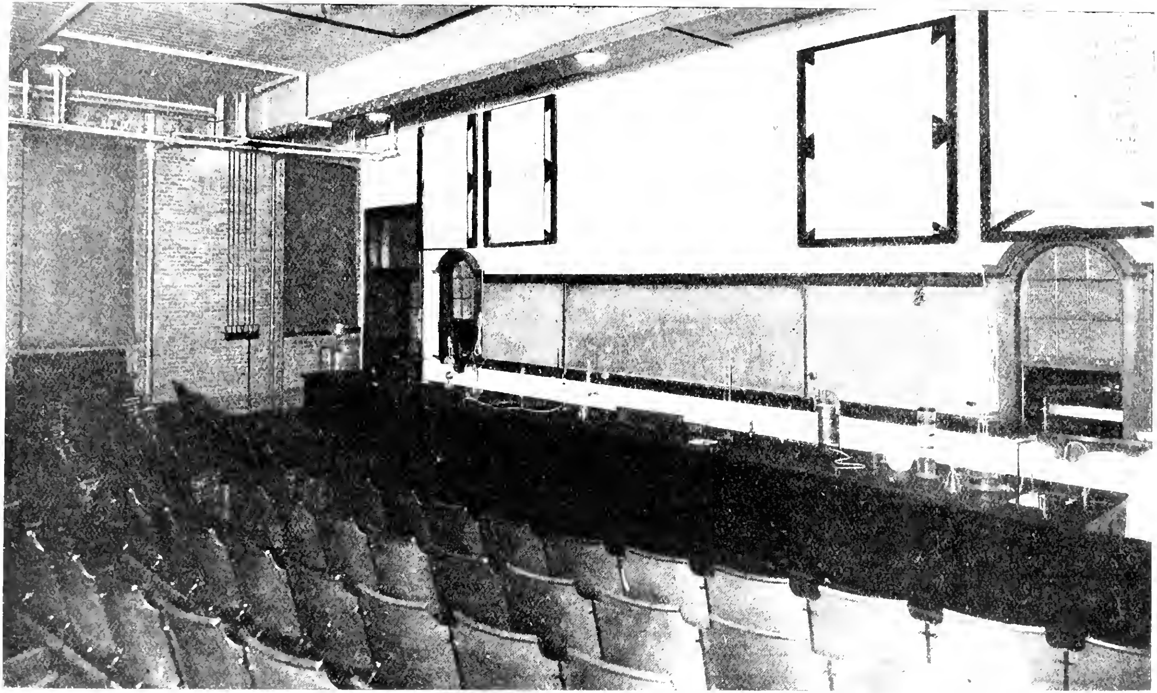
S. P. S. Chemistry and Mining Building—View from Southeast



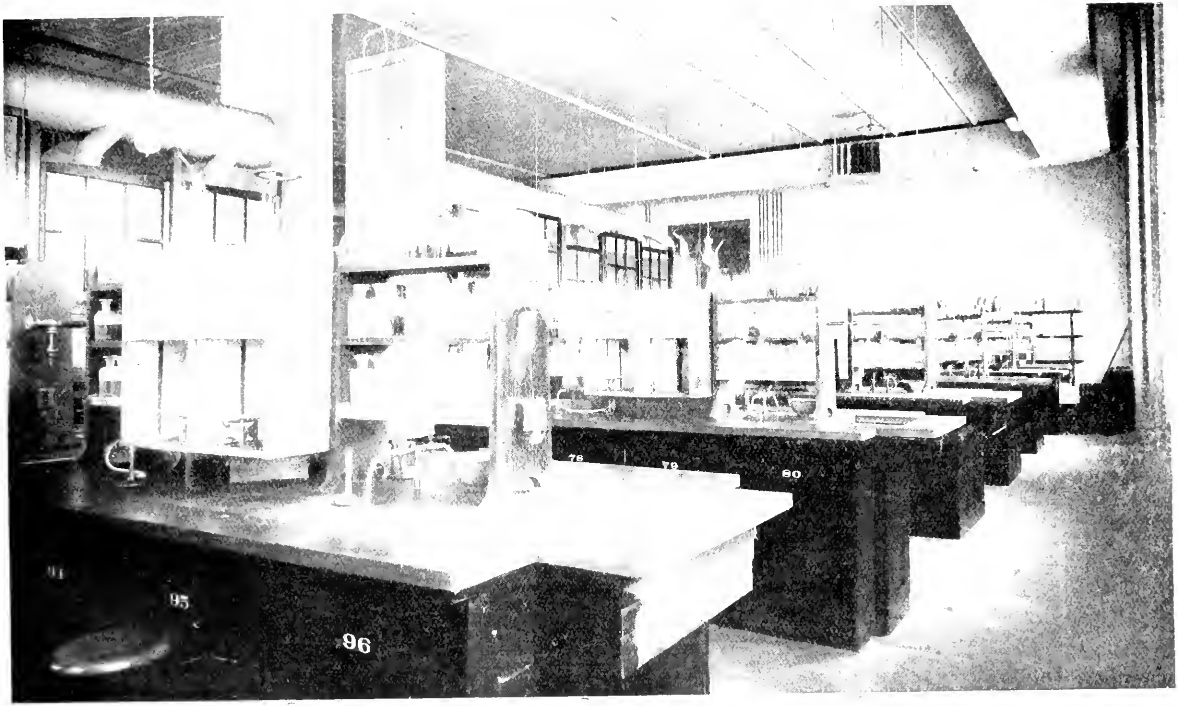
S. P. S. Chemistry and Mining Building—Electro-Chemical Commercial Cell Room.



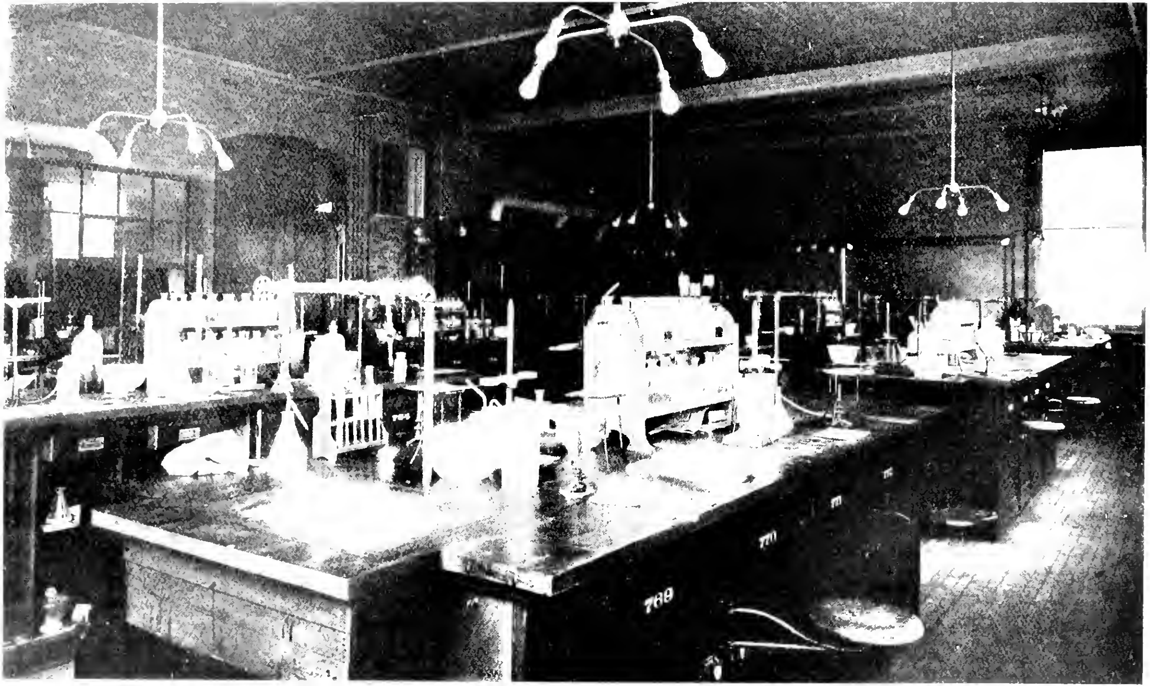
S. P. S. Chemistry and Mining Building—Electro-Chemical Laboratory



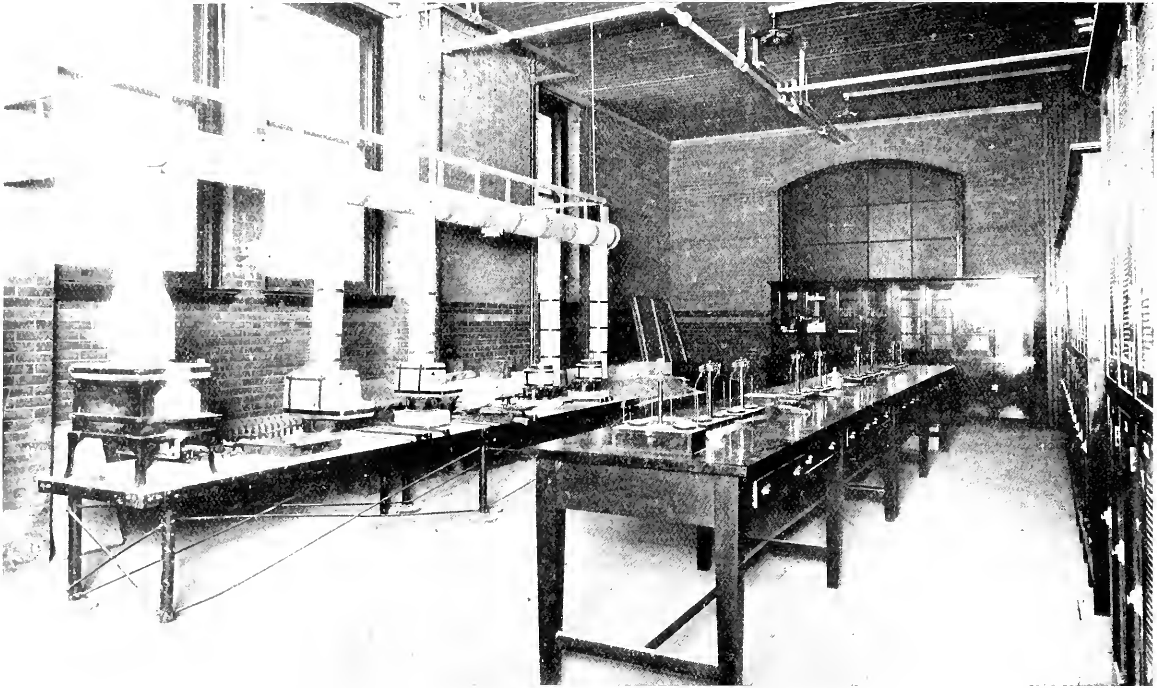
S. P. S. Chemistry and Mining Building—Chemical Lecture Theatre, seating capacity 250.



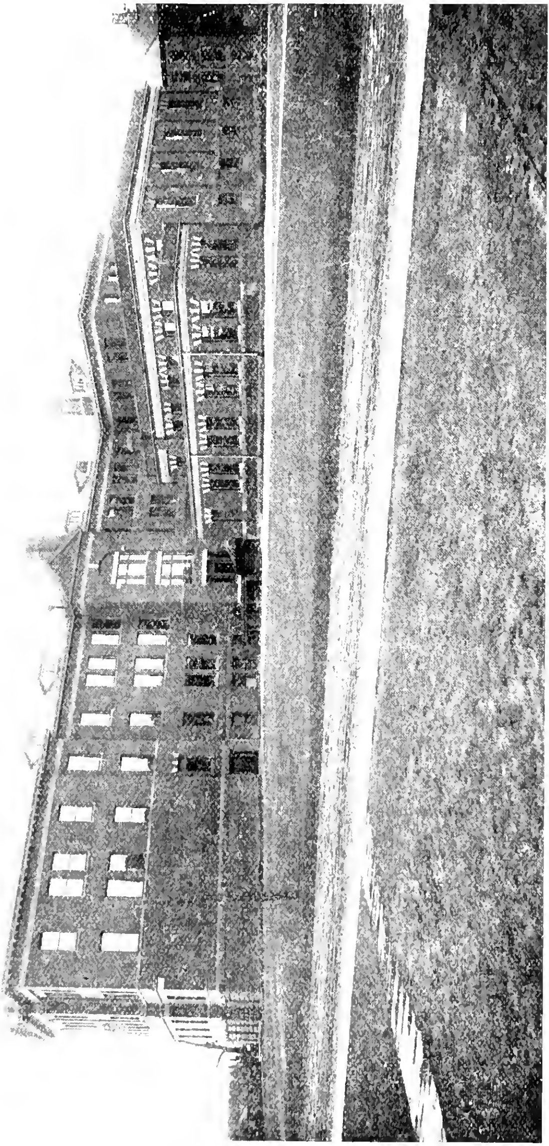
S. P. S. Chemistry and Mining Building—Chemical Laboratory (1st and 2nd year).



S. P. S. Chemistry and Mining Building—Chemical Laboratory (3rd year).



S. P. S. Chemistry and Mining Building—Mining Assay Laboratory.



S. P. S. Chemistry, Mining and Milling Buildings—View from Northeast.

Nipissing District.

The contract for the erection of a goaler's house and alterations to the Goal at North Bay to give more accommodation in the latter which for some time has been overcrowded, was awarded to Messrs. R. Wallace & Son, contractors, of North Bay, after tenders had been duly called for. The work in connection with the dwelling house in well advanced and this building should be completed by about March 1st, and the alterations to the Goal about one month later. The necessary repairs to Court House and Goal have been made. Repairs, as required, have been made to the Court House and Goal at Mattawa.

Algoma District.

Repairs were made to the Court House and Goal at Sault Ste. Marie and the various Lock-ups throughout this District.

Thunder Bay District.

Repairs have been made to the Goal and Court House at Port Arthur and new plumbing installed in the Goal and Goaler's house by Mr. J. Marshall, of Port Arthur, who did the work under contract. Metallic fittings have been supplied to the vault in the Court House.

Rainy River District.

Repairs have been made to the Goal and Court House at Kenora.

Furniture has been supplied when found necessary to all of the Court Hous.s, Goals and Registry Offices and Lock-ups throughout the Districts.

Boiler Inspection.

The work in connection with the inspection of boilers in the Institutions under the Provincial Government was formerly attended to by the Steam-fitter of this Department and who was appointed Chief Engineer at the School of Science on 1st December, 1904, is now being attended to by Mr. D. M. Medcalf, who was appointed Inspector of Boilers and Machinery on the 1st of May, 1905, and who since that time has inspected all of the boilers and machinery in the different Institutions and reported thereon. All of the boilers and machinery in each Institution, including the electric plants, will be inspected not less than twice a year with steam on and off, and as often as may be necessary. The Inspector makes a report to the Architect in reference to their condition and duplicate reports are sent to the Inspector of Asylums and Prisons, who instructs the Superintendents of the different Institutions to have he repairs, ec., attended to. The Boiler Inspector will go to these places and, where necessary, supervise the work, and in all cases see that the repairs are properly made. Where new boilers are being made for the Department, he will also inspect them while under construction, testing materials before they are put together and testing the boilers when erected in the shops.

All of which is respectfully submitted.

I have the honor to remain, Sir,
Your obedient servant,

F. R. HEAKES,
Architect.

REPORT OF THE ENGINEER.

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
TORONTO, February 5th, 1906.

HON J. O. REAUME,
Minister of Public Works, Ontario.

SIR,—I have the honor to report respecting the engineering works that have been constructed; repairs and improvements made to bridges, locks, dams, etc.; drainage works that have received aid under the Provincial Drainage Aid Act; and the extension of railways in the Province of Ontario during 1905.

BRIDGES, RAINY RIVER DISTRICT.

Bridge at outlet of Lake of the Woods.—A new steel bridge across the east branch of the Winnipeg River, in the Town of Rat Portage, was completed and opened for traffic early in March. A full description of the bridge was given in the report of last year.

The total length of the bridge is 411 ft. 8 in.; the width of the roadway is 18 feet in the clear; and provision is made for adding in the future a footwalk 6 feet in width. The substructure consists of two concrete abutments and two concrete piers. The superstructure consists of three spans of the type of trusses known as Pratt single intersection, stiff rivetted throughout. The steel work was supplied and erected by the Locomotive Machine Company of Montreal at a cost of $12,450.00.

Bridge across Portage Bay, Keewatin.—Plans and specifications were prepared and tenders were asked by advertisement in the local papers for a timber bridge across Portage Bay, in the Village of Keewatin. The tender of Frederick Gilbert of Keewatin for the sum of $4,775.00, being the lowest, was accepted, and the contract awarded to him.

The bridge consists of four spans of 40 feet in the clear and ten spans of 20 feet, supported on pile foundations. It has a clear width of 18 feet and has a total length of 391 feet. The bridge was completed and opened for traffic on December the 20th. The work was superintended by Mr. James Fraser of Keewatin, an experienced bridge builder.

Bridge at Pinewood.—Tenders were asked for the reflooring, and other repairs, of the bridge at Pinewood, and the work was awarded, for the sum of $375.00 to Mr. A. McQuaker of Pinewood, whose tender was the lowest. The work was inspected by Mr. David Wier, who reported it as completed in a satisfactory manner.

Bridges, Jaffray Township.—Repairs to two bridges on the Scramble Mine road, in the Township of Jaffray, were made by men employed under the supervision of Mr. James Fraser, Inspector of Colonization Roads, at a cost of $97.82, chargeable to Maintenance account. One of the bridges was shortened; the abutments were raised three feet and the approaches filled with gravel.

Bridge at Outlet Lake of the Woods, Kenora. Opened for traffic, March, 1905

Bridges, Algoma District.

McBeth Creek bridge.—A bridge over McBeth Creek, on the Thessalon and Bruce Mines road, in the Township of Lefroy, was renewed at a cost of $230.31, chargeable to Maintenance account. The course of the creek was straightened, and the span shortened to 16 feet. Substantial abutments were built, with wing walls to protect the filling of the approaches. The length of the work is 98 feet and height 7 feet; the abutments, wing walls and stringers are of cedar, and the flooring of hemlock plank.

Kirkwood bridge.—The bridge across Little Thessalon River at Kirkwood, was renewed at a cost of $468.30, chargeable to Maintenance account. The bridge consists of one span of 60 feet and one of 25 feet, supported on one abutment of cribwork filled with stone, a centre pier and another abutment constructed of piles. The flooring, 85 feet in length, is of three-inch hemlock plank.

McKenzie's bridge.—The bridge across the east branch of the Thessalon River, on the road leading to Dunns' Valley was renewed; it has a length of 64 feet and is supported on framed bents resting on mud sills, which extend across the stream; the centre span is 32 feet, the stingers are of pine 12x12 inches and the flooring is of flatted cedar. Two small bridges, 36 and 24 feet in length respectively, were also renewed at short distances west of McKenzie's bridge. The cost of the three bridges, $177.63, was charged to Maintenance account.

Hanbury Creek bridge.—A bridge across Hanbury Creek, near Ophir, on the northern road, was renewed at a cost of $200.00, chargeable to Maintenance account. The bridge is 64 feet in length, supported on pile foundations.

Tulloch's bridge.—A bridge over a creek near Tulloch's, in the Township of Gladstone, on the Iron Bridge and Dean Lake road was renewed at a cost of $207.71, chargeable to Maintenance account. The bridge is 68 feet long, supported on pile foundations.

Clark's bridge.—A bridge over the Thessalon River, in the Township of Lefroy, known as Clark's bridge, was rebuilt at a cost of $539.65, chargeable to Maintenance account. The total length of the bridge is 105 feet and height 13 feet. The main span is 45 feet; the western approach 28 feet and eastern approach 32 feet. The foundation is of white oak piles, with a double row under the centre span. The flooring of the old bridge, being in a fairly good condition, was relaid.

Scow Ferries.—A contribution of $156.00, being one-half the cost of repairs to the scow ferry across the Spanish River, was given to the municipality of Salter, May and Harrow. This ferry is situated near the Village of Massey, and is the only means by which a large number of settlers living south of the river can cross the stream. The scow ferry across the Mississauga River, Township of Thompson, was repaired at a cost of $34.00.

Bridges, District of Nipissing.

Bridge over West Arm, Lake Nipissing.—Two bridges over the west arm of Lake Nipissing, on the boundary road between the townships of Cassimir and Haddo, commenced in the year 1904, were completed early in the season. The one over the northerly channel is 326 feet in length; the one over the southerly channl is 456 feet in length. Provision is made in the

southerly channel for the passage of boats through the bridge by means of a moveable section.

Veuve River bridge.—A new bridge was constructed across the Veuve River to replace one carried away by the spring freshet in the year 1904. In rebuilding it was located on the line between lots numbered 8 and 9, concession 1, Township of Dunnett, some distance easterly from the old site, and is now more convenient to the majority of the settlers. The bridge is 104 feet in length, 16 feet in width and is supported on pile bents; the centre span is 24 feet and the remaining spans 20 feet centres.

Sturgeon River bridge, Township of Gibbons.—The scow ferry used by the settlers in Gibbons Township for many years to cross the Sturgeon River having become inadequate for the increased traffic caused by the settlement of this and adjoining townships, a new bridge was constructed across the stream a short distance below the site of the old ferry on lot No. 7, concession 1. The bridge consists of three spans 60 feet in the clear and is supported on pile piers and abutments

McCarthy Creek bridge.—A new bridge was constructed across McCarthy's Creek, northwest of the last described bridge on Lot No. 11, concession 3, Township of Gibbons. The bridge is 100 feet in length, 16 feet in width, and is supported on pile bents at twenty feet centres.

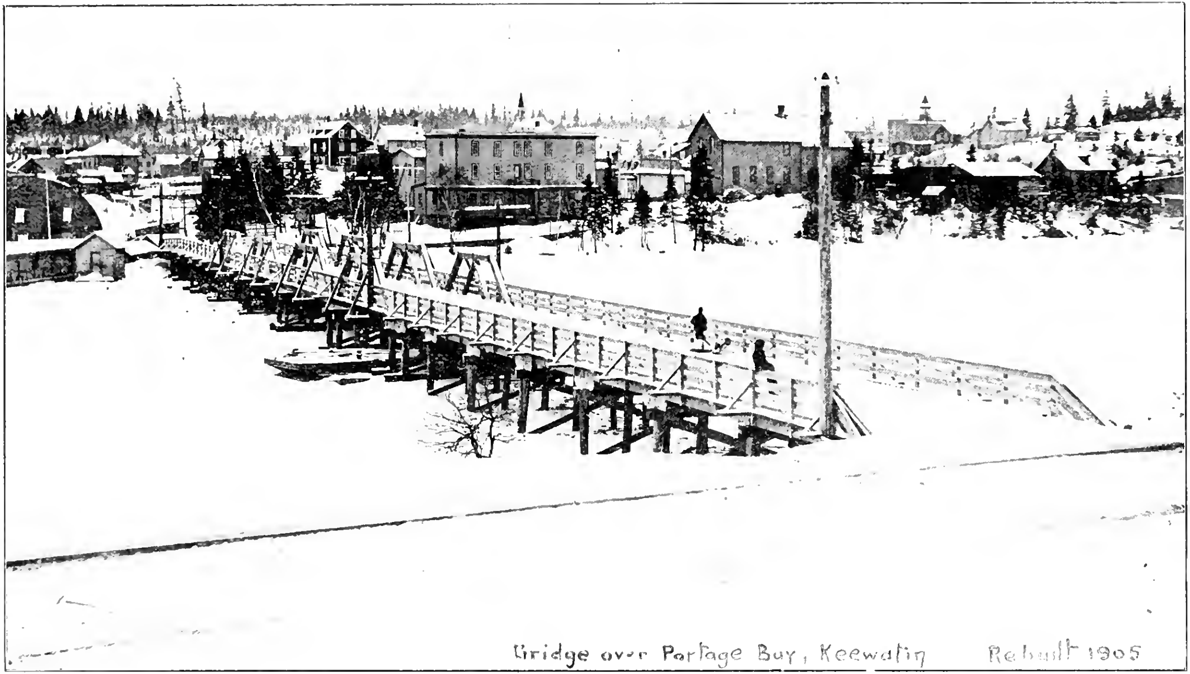
Martland Township bridge.—A new bridge was built across the Wolseley River, between lots 7 and 8 in the 3rd concession of the Township of Martland. The bridge is 100 feet in length, 16 feet in width and is supported on piers of cedar and pine filled with stone.

Dunnett and Appelby.—A new bridge was built on the boundary road between the Townships of Dunnett and Appelby across a small stream on the 3rd concession. The structure is about 35 feet in length, 5 feet above the water and is built on piers which are filled with stone. The approaches, which were very flat for a distance of ten rods on each side of the stream, were filled with stone and earth.

Mattawa bridge.—The old timber bridge across the Mattawa River, in the Town of Mattawa built for many years, and had been repaired from time to time until a new bridge became necessary. The old bridge was 670 feet in length and about 18 feet in height, it had a roadway 16 feet in width and a foot walk 6 feet in width. During the year 1905 four substantial concrete abutments were built for the support of two steel spans, 100 feet and 112 feet long respectively over two channels, into which the river is divided. The abutments are 29 feet long on the face and have two wing walls each 14 feet, 6 inches in length. The approach on the west has been filled for a length of 251 feet with earth and stone forming an embankment 27 feet wide on top with side slopes of one horizontal to one verticle; the faces of the embankment are neatly laid in dry stone masonry. A similar embankment has been made across the island between the two channels, of a length of 118 feet. The easterly approach, 94 feet in length, is formed in the same way. This work has been carried out under the direction of Mr. Hugh Mooney, of Mattawa, in a most substantial and excellent manner. It is proposed to erect, during the year 1906, two steel superstructures of the lengths before stated, having a roadway 18 feet in clear width and a foot walk 6 feet in width. The cost of the concrete abutments and stone filling was $6,986.63.

This bridge, as well as all the bridges erected in the District of Nipissing, was supervised by Mr. Alex. Tourongeau, who is an energetic and efficient superintendent.

Bridge over Portage Bay, Keewatin. Erected 1905.



Bridge over Portage Bay, Keewatin   Rebuilt 1905

BRIDGES, DISTRICT OF PARRY SOUND.

Pickerell River bridge.—A bridge across the Pickerell River, in the Township of McConkey, was built during the winter months. The total length of the bridge is 274 feet, 148 feet thereof being built on round hemlock piers from three to ten feet in height. One main span 70 feet and two spans each 30 feet are supported on piers 18 feet and 10 feet high, filled with stone to a height of 10 feet and 5 feet respectively. The main span is carried by a Queen truss. The total cost of the bridge was $970.00.

South River bridges.—An appropriation of $500.00 was made to rebuild the bridge across the South River, in the Village of South River, Township of Machar. As the municipality had no legal right of way to the site of the old bridge and were unable to procure one, it was proposed by the municipality to change the site to a point farther down the stream to where a new right of way had been acquired more convenient than the old one. Two short bridges over two channels into which the stream is divided, each 40 feet in length, were built on timber abutments 7 ft.x14ft., six feet in height, rock bolted and filled with stone. The spans are carried by King trusses. The cost of the bridges was $622.74.

Berriedale bridge.—A bridge across the Magnetawan River, at Berriedale, in the Township of Armour, was rebuilt at a cost of $950.17. This bridge is 168 feet in length and 14 feet in width, and is supported on pile piers. The piles are of tamarac 36 feet in length. The bridge timbers are of pine, the flooring and railing of hemlock.

Maple Island bridge.—A bridge across the Magnetawan River at Maple Island, in the Township of McKenzie, was rebuilt at a cost of $993.32. The bridge is 130 feet in length, supported on timber crib piers; two of the old piers, 16 feet long, 10 feet wide and 12 feet in height were repaired where necessary, and a new centre pier was built 18 feet in length, 8 feet wide and 18 feet in height, and filled with stone. The two centre spans are 36 feet long, supported by King trusses. The bridge timbers and handrailing are of pine and the flooring is of hemlock plank, 3 inches in thickness.

Powassan bridges.—The sum of $300.00 was voted to assist in rebuilding two bridges in the Village of Powassan, the work to be undertaken by the municipality. The work was inspected by the foreman of bridges for the district who reported them as finished in a satisfactory manner. The amount of the grant was, therefore, paid to the treasurer of the Town of Powassan.

Shawanaga and Nescueton bridges.—Repairs were made to several bridges on the Byng Inlet road, chargeable to Maintenance account as follows: A bridge 40 feet long over a deep gully between Nescueton and Byng Inlet. The bridge across the Nescueton River was raised and thirty feet of the flooring relaid and loaded with stone. Several corduroy bridges were repaired by inserting new pieces where broken. A new bridge 40 feet in length was built about nine miles west of Shawanaga, the old one having been washed away by the spring freshet.

Knœpflies bridge.—A bridge over the Magnetawan River, at the outlet of Ahmic Lake, was replanked with two-inch planks for a width of eight feet on top of the old covering. Some repairs were made to another bridge a short distance to the west of the last mentioned bridge. The cost of these repairs were charged to Maintenance account.

Whitestone bridges.—Necessary repairs were made to the bridges across Whitestone River, in the Township of McKenzie, early in the season. There

are two bridges across two channels 48 and 41 feet long respectively. These were replanked and railings renewed at a cost of $223.86, chargeable to Maintenance account.

The bridges in Parry Sound District were built under the supervision of Mr. D. H. McIntosh, of Trout Creek, a practical bridge builder. In addition to the bridges already mentioned he superintended the erection of bridges at White Oak Creek, Strong Township, and Pringle Township, reported by the Colonization Roads branch.

Bridges, District of Muskoka.

Bracebridge bridge.—A grant of $7,000.00 was made to assist the municipality of the Town of Bracebridge in building a bridge across the north branch of the Muskoka River. The erection of the bridge has been carried out by the town at a cost of $13,650.00, exclusive of the work of grading the approaches which will cost a considerable sum. It is a substantial and permanent structure and consists of one span, 190 feet in length, supported on concrete abutments. The roadway has a clear width of 18 feet, and a footwalk 6 feet in width is provided. The steel work is made strong enough to carry a concrete floor and was supplied and erected by the Hamilton Bridge Works Company of Hamilton, for the sum of $8,000.00.

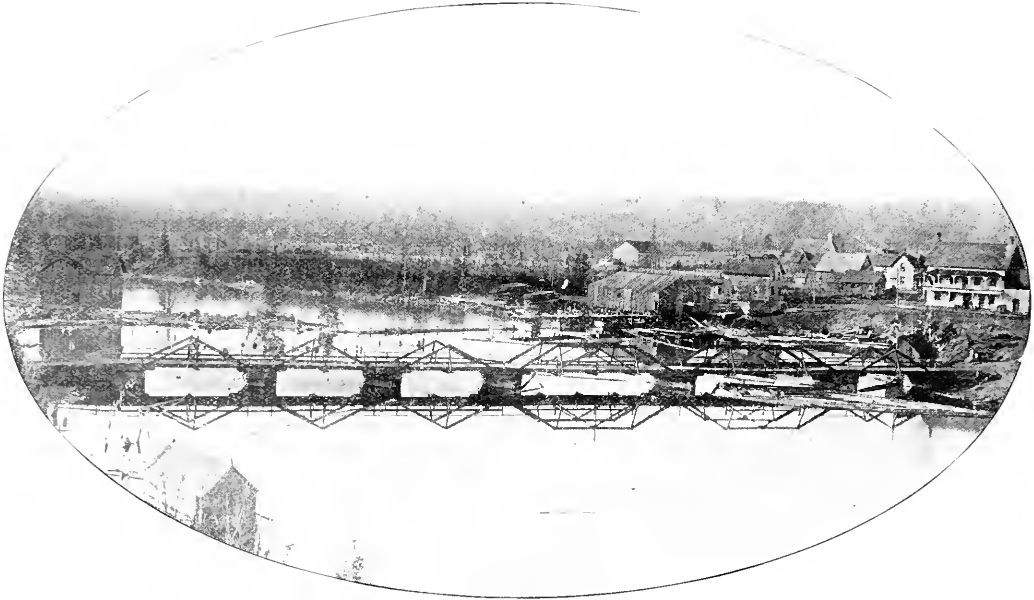
An inspection of the work was made on the 21st of November, when the substructure was completed and the work on the steel was under way. As the work was found to be done in a satisfactory manner, the amount of the grant was paid to the Treasurer of the Town of Bracebridge.

Hoodstown Road bridge, Chaffey Township.—A grant of $1,200.00 was voted to assist the municipality of the Township of Chaffey, in the erection of a bridge over the Big East River, on the Hoodstown road.

The bridge consists of one span 64 feet in length constructed of steel, with steel joists, supported on stone piers on concrete and pile foundations. The approaches for the present are wood trestles 46 feet in length at each end. The work was carried out by the municipality. Plans and specifications were furnished by this Department. An inspection of the work was made on the 22nd of November, when the substructure was nearing completion and the steel work delivered on the site. As the work was well and satisfactorily done the amount of the grant was paid to the Treasurer of the Municipality of Chaffey.

Baysville bridge.—A grant of $2,000.00 was paid to the Municipality of Ridout and McLean, towards a new bridge across the south branch of the Muskoka River, in the Village of Baysville, in the year 1904. An additional grant of $900.00 was voted at the last session of the Legislature, the municipality having erected a substantial steel structure as fully described in the report of last year. An inspection was made in July last and the bridge, having been fully and satisfactorily completed, the amount of the grant, $900.00, was paid to the Treasurer of the Municipality of Ridout and McLean.

Severn River bridge in Morrison.—In the year 1904, aid to the amount of $2,500.00 was paid by the Province towards the construction of a bridge across the Severn River, a short distance above Sparrow Lake, connecting the Township of North Orillia, in the County of Simcoe, with the Township of Morrison in the District of Muskoka. A full description of this bridge was given in the report of last year. An additional grant of $850.00 was made at the last session to meet one-half the cost of this bridge; the County of



Timber Bridge, Baysville. Erected 1876. Replaced by Steel Bridge 300 feet up stream in 1905.

New Steel Bridge, Baysville. Erected 1905.

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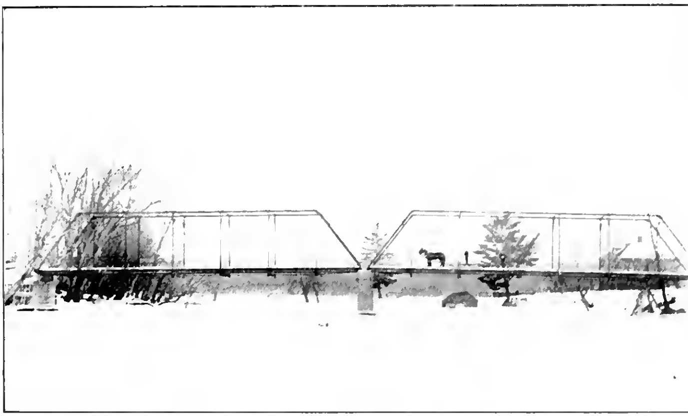
Simcoe to provide the other one-half. An inspection was made on the 20th of March last, when the work was found to be completed satisfactorily and the amount of the grant, $850.00, was paid to the Treasurer of the County of Simcoe.

Ox-tongue bridge, Township of Franklin. Repairs were made to the bridge over Ox-tongue River at Marsh's Falls to the amount of $108.99, chargeable to maintenance account. One pier was renewed; the bridge raised; and floor replanked.

Port Severn bridges, Township of Baxter. Repairs were made to three bridges at Port Severn amounting to $126.55 chargeable to Maintenance account. The easterly bridge was refloored with two-inch planking on the top of the old floor; one-half of the work was done by the Township of Tay, County of Simcoe, and the other one-half by the Province; slight repairs were made to the abutment of the centre bridge; the flooring of the west bridge was renewed with three-inch planking and the railing repaired.



Severn River Bridge, near Outlet of Sparrow's Lake, Township of Morrison

INDIAN POINT BRIDGE, MANITOULIN ISLANDS.

The swing bridge at the entrance to Wolesley Lake from Georgian Bay, Manitoulin Island, was damaged by a steamer when entering the channel, which necessitated repairs to the bridge and abutment to make it safe for travel. The bridge has long approaches filled with stone and gravel, which are subjected to the wash of heavy seas; the action of the waves washes the gravel from the road, leaving bare rough stones in places and piling the gravel and sand in heaps and ridges; although a close board railing had been erected to protect the road from the action of the waves.

Repairs were made to the bridge to render it safe; the board railing was repaired and strengthened; and the approaches were graded and gravelled.

The work was carried out by men employed under Mr. Mm. T. Cook of Fernlee, as foreman, at a cost of $1,339.96.

Wright's Creek Bridge.

A bridge over Wright's Creek, in the Township of Casey, District of Temiskaming was constructed under contract by Mr. Wm. Judge. The bridge consisted of a span of 80 feet supported on timber cribs. When the work on the bridge was completed, a severe storm occurred, on the 28th of April, which caused a jam of logs above the bridge, and dammed back the water in the creek to an abnormal height and carried away the structure and undermined the piers. Another appropriation will be required to rebuild this bridge.

Calabogie Bridge, Township of Bagot.

A grant of $1,000.00 was made at the last session of the Legislature to the municipality of Bagot and Blithfield to aid in the construction of a new bridge over the Madawaska River, at the eastern outlet of Lake Calabogie, on lot No. 17, concession 10, Township of Bagot. The superstructure has been erected of steel of theWarren type of trusses, 84 feet in length, 16 feet in width and supported on concrete abutments 15 feet in height. The total cost of the work was $3,280.00. The steel work was supplied and erected by Dickson Bros. of Campbellford, at a cost of $1,000.00.

An inspection of the bridge was made in September when it was found that the work had been completed in a satisfactory manner. The amount of the grant was, therefore, paid to the Treasurer of the municipality of Bagot and Blithfield.

Payne River Bridges, Township of Finch.

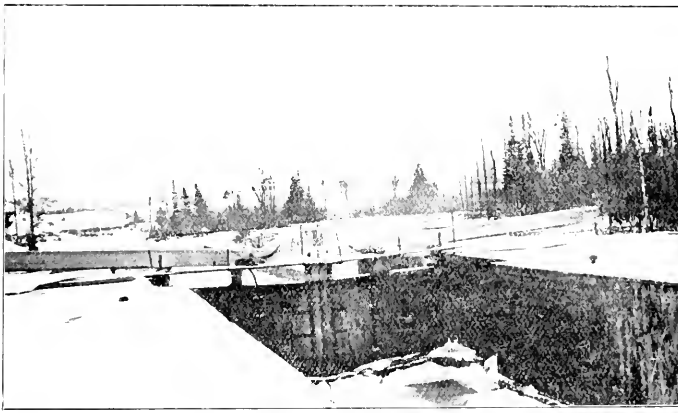
An appropriation of $2,500.00 was made by the Legislature to aid the Township of Finch, in the erection of four new steel bridges over the Payne River. The first known as the Swale bridge situated on the road between concessions 9 and 10, consists of a steel span of 50 feet in length, and 14 feet in width, supported on concrete abutments 18 feet in height. The stream at this point was very tortuous. A new channel was made with a straight course at right angles to the road. The approaches on both sides of the bridge, a total length of about 600 feet, were filled with earth to an average height of 12 feet. The cost of the work was $7,532.10. The second bridge known as the Duhame bridge, situated on the road between concessions 8 and 9, consists of a steel superstructure 50 feet in length, 14 feet in width, supported on concrete abutments about 13 feet in height. The approaches are filled with earth about 200 feet in length on the west, and 75 feet on the east side. The cost of the work was $3,315.00. The third bridge known as Patterson's, situated on the road between concessions 5 and 6, has a steel superstructure 65 feet in length, 14 feet in width, supported on concrete abutments about 13 feet in height. The approaches are filled with earth about 300 feet in length on the west, and 75 feet on the east side. The cost of the work was $2,700.00. The fourth bridge, known as Manion bridge, situated on the road between concessions 3 and 4, has a steel superstructure 110 feet in length, 16 feet in width, supported on concrete abutments, 14 feet in height. The approaches are filled with earth and have a length of 250 feet on the west and 70 feet on the east. The cost of the work was $6,498.00.

The trusses of the 110 feet span are of the type known as Pratt trusses, the smaller spans are of Warren pony trusses, and steel joists are provided for

all the bridges. The steel was supplied and erected by The Hamilton Bridge Works Company for the sum of $4, 488.00. The total cost of the bridges is $20,045.00. An inspection of the work was made on the 21st of December, and, as the work was found completed in a satisfactory manner, the amount of the grant, $2,500, was paid to the treasurer of the Township of Finch.

Mary's and Fairy Lakes Works.

The cribbing above and below the lock between Mary's and Fairy Lakes, on the Muskoka River about two miles south of Huntsville, had become so decayed as to be unsafe and there was danger of it giving way and damaging the saw mill adjoining. An appropriation of $3,000.00 was provided at the last session to renew this cribbing. The necessary timber was purchased from the Muskoka Wood Manufacturing Company of Huntsville, their tender being the lowest, and the price satisfactory. The work was



Mary's and Fairy Lakes Lock, near Huntsville, Muskoka.

commenced in August last and will be continued during the season of the close of navigation, so that the traffic on Marys Lake will not be interrupted.

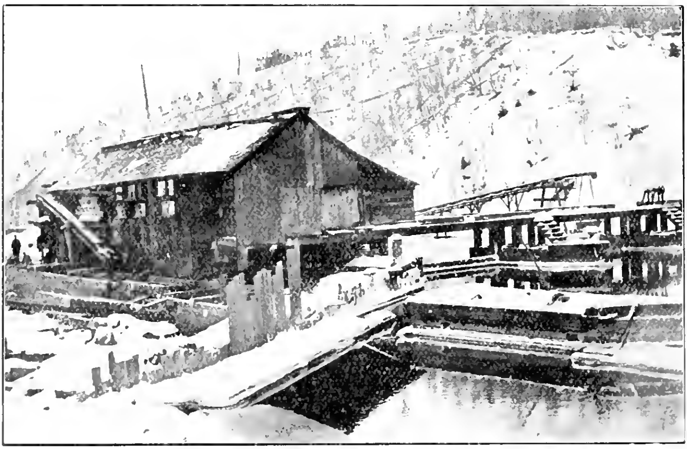
The cribbing above the lock is being renewed for a length of 150 feet on the west side of the canal, 8 feet wide and 9 feet high, and for a length of 40 feet on the east side, 6 feet wide and 9 feet high. The cribwork below the lock, 497 feet long, required only slight repairs to replace decayed timbers.

High Bridge above Marys and Fairys Lake lock.—The high bridge over the Muskoka River above the lock with a span of 100 feet, supported on high timber trestles was in a decayed condition. An appropriation of $3,500.00 was taken at the last session to renew this bridge in steel, with

steel trestle supports on concrete piers. The work on the concrete piers was completed in December at a cost of $700.00. A revote will be required of the balance for the steel superstructure and approaches.

Peninsula Canal.

The crib work in many places along the banks of Peninsula Creek, which connects Fairy Lake with Peninsula Lake was in a decayed condition. An appropriation of $5,000.00 was made at the last session of the Legislature to renew this work. The work was commenced on the 1st of July and completed on the 14th of August at a cost of $2,236.39. The work was renewed in hemlock timber which was supplied by the Muskoka Wood



Cribbing at Head of Canal between Mary's and Fairy Lakes, showing Coffer Dam.

Manufacturing Company of Huntsville, at $14.00 per M. B. M. The lowest price asked for pine timber was $32.00 per M. B. M. At this price for pine it was deemed economical to use hemlock instead, as the shorter life of hemlock was more than compensated by the lower cost thereof. In all a length of 1,331 feet was renewed averaging three feet in height. The face of the cribwork was constructed of 10x12 in hemlock, with cedar ties and back timbers.

North River, Township of Orillia.

An appropriation of $250.00 was made at the last session of the Legislature to provide for the removal of rock obstructions, North River. A rock cut was made on the 5th concession, township of North Orillia, 46 feet long, 14 feet wide and varying in depth from two feet to four and one-half feet, at a cost of $249.92.

Maskinonge Creek, Cassimir Township.

An appropriation of $500.00 was made at the last session of the Legislature for removing obstructions from Maskinonge Creek. Work was commenced on the 8th of August and completed on the 5th of September. A cutting was made through a ledge of rock, 60 feet in length, 39 feet in width and two feet in depth. The creek was cleaned out from sunken logs, fallen and overhanging trees, etc., for a length of about two miles above the rock obstruction. This work will give improved drainage for a large area of lands and roads. The cost of the work was $499.92.

Bar River, Township of McDonald.

A rock obstruction extended nearly across the Bar River on section 36, Township of McDonald, which caused the water in time of spring freshet to flood the roads and low lands along the shore. The natural channel at low water was only 8 ft. 6 in. wide. This was increased by blasting the rock until a channel of about 22 feet was obtained. The cost of the work was $130.55.

Bridges and Cribbing above Mary's and Fairy Lakes Lock.

Maintenance Locks, Dams and Bridges.

In addition to the works already mentioned, the following works were attended to out of the appropriation for the maintenance of locks, dams and bridges.

Port Carling Lock.—Only slight repairs were made at Port Carling during this year. One stringer in the wharf on the south side of the lock was renewed and the flooring repaired. The bridge across the Indian River is in a decayed condition; posts were put under it, to prevent accident from collapse. An appropriation will be required to renew this bridge in the coming year.

Bala bridges.—The bridges over the northern channel at Bala are in a worn out condition; necessary repairs were made to the flooring. An appropriation will be required to renew these bridges during 1906.

Moon Chute, Musquosh River.—A boom 325 feet in length was placed across the channel above the Moon Chute on the Musquosh River about three miles below Bala. This point was a most dangerous place owing to the river being full of bays, the entrance to the chute or falls had the appearance of one of these bays, and any one, boating in the vicinity and unaware of its existence, would be in great danger of being carried over the falls.

Marys and Fairy Lakes locks.—The lock chamber of the Marys and Fairy Lakes lock was cleaned out thoroughly by divers, and some repairs were made to the swing bridge across the canal above the lock.

Huntsville Swing bridge.—The flooring of the swing bridge in the Town of Huntsville owing to the constant heavy traffic over it was completely worn out in a few years and was in a dangerous condition. A floor eight feet wide of two-inch plank was laid over the old covering. Slight repairs were also made to the locking attachment of the bridge.

Bridge over Peninsula Canal.—A portion of the flooring of the bridge over Peninsula Canal was renewed with three-inch planking.

Magnetawan lock.—Repairs were made to the lock-gates early in the season by a diver. Six piers below the lock that were in a decayed condition were renewed in the month of October.

Dredging Magnetawan River.—About 2,250 cubic yards were excavated from the river at Cecebe Lake in the month of September. Three large buoys were placed at the mouth of the river at Cecebe Lake, and one on a shoal near Watson's Island at the lower end of the lake, four buoys at Pope's Point were replaced with larger ones.

Swing bridge in Ryerson.—A three stick boom 70 feet in length was placed at the lower end of the pivot pier of the swing bridge across the Magnetawan River, in the Township of Ryerson, to prevent the steamers and scows from striking the concrete pier. The upper end of the boom was secured to a cribwork pier 12 feet square, constructed of 10 in. by 12 in. timbers, and filled with stone.

Deer Lake dam, Magnetawan River.—Two winches were supplied by the Wm. Hamilton Company of Peterborough for use in raising and lowering the stop-logs which were too heavy for one man to raise with the ordinary windlass. A track was laid of light railroad iron for easily moving the winches to the several openings as required.

Lindsay lock.—A portion of the top of the lock wall was replanked. Stop logs were put in above the lock at the close of navigation and the walls of the lock chamber caulked.

Lindsay Street swing bridge.—The swing-bridge over the Scugog River on Lindsay Street, in the Town of Lindsay was refloored with three-inch plank.

Swing bridge, Ops Township.—The swing bridge over the Scugog River, situated about one mile south of the Town of Lindsay, was repaired in the month of April when one king post of truss was spliced and a piece of timber renewed on south end of bridge. In the month of August, four needle beams and eight angle braces were renewed, a portion of the flooring was relaid and the truss rods were adjusted.

Young's Point lock.—Repairs were made to the hollow quoins and hinges of the lock gates, and planking was supplied to protect the flooring of the swing bridge.

Balsam River lock.—Only slight repairs were made to the works at this point, new blocks were placed under the windlasses.

Norland dam and slide.—Repairs were made to the boom and slide at Norland dam on the Gull River.

Elliott's Falls, dam and slide.—Two new windlasses were supplied to this dam and slight repairs made to the slide.

White Lake dam.—Two stop-logs were supplied and repairs made to the windlass at White Lake dam, on the Burnt River.

Pine Lake dam.—Temporary braces were placed below the dam to prevent it giving way. The bridge which crosses the dam was replanked to a width of 12 feet with two-inch plank.

Scott's Mills, dam and slide.—This dam is situated on Mississauga Creek, slight repairs were made to the slide, a portion of the floor was renewed, and the boom repaired.

Mississauga Creek, dam.—Three stop-logs were supplied, one stop-log post was renewed, and repairs were made to the floor of slide.

Simmon's bridge, Burnt River.—Repairs were made to this bridge in the month of October. The two centre piers were strengthened by firmly spiking posts at both sides under the corbels to take the weight of the bridge off the top of the piers which were very rotten; both sides of the piers and the up stream end were sheeted with two-inch plank. The south approach was formed of round timber cribwork.

Keewatin dam.—The stop-logs in the Keewatin dam were taken out and replaced as required, and the driftwood was cleared from the openings.

The elevation of the water in the Lake of the Woods was regulated for the purposes of navigation throughout the season. New gauges were supplied and placed in position.

Log-slide Wahnapitae Lake.—A caretaker was put in charge of the log-slide between Lakes Metagamesing and Wahnapitae while the logs were passing through in the latter part of the month of May and the first week in June. The following quantities of timber passed through the slide in the time mentioned.

Victoria Harbour Lumber Company, 276,395 saw logs equal to 10,854,-985 feet board measure., also 1,446 pieces of boom timber equal to 319,075 feet board measure.

The C. Beck Manufacturing Company, 84,397 saw-logs equal to 2,993-602 feet board measure, also 688 pieces of boom timber equal to 213,064 feet board measure.

Lockmasters' Returns.

The following are the lockmasters' returns of lockages made during the year 1905:

Port Carling lock.—3,960 steamers, 821 small boats, 657 scows, and 152 rafts or cribs of timber.

Marys and Fairy Lakes lock.—754 steamers, 52 small boats, 125 scows, and 136 rafts or cribs of timber.

Magnetawan lock.—907 steamers, 53 small boats, 223 scows, and 57 rafts or cribs of timber.

Lindsay lock.—144 steamers, 468 small boats, 141 scows, and 100 rafts or cribs of timber.

Young's Point lock.—1,306 steamers, 149 small boats, 277 scows, and 220 rafts or cribs of timber.

Balsam River lock.—391 steamers, 174 small boats, 111 scows, and 40 rafts or cribs of timber.

Extension of Railways.

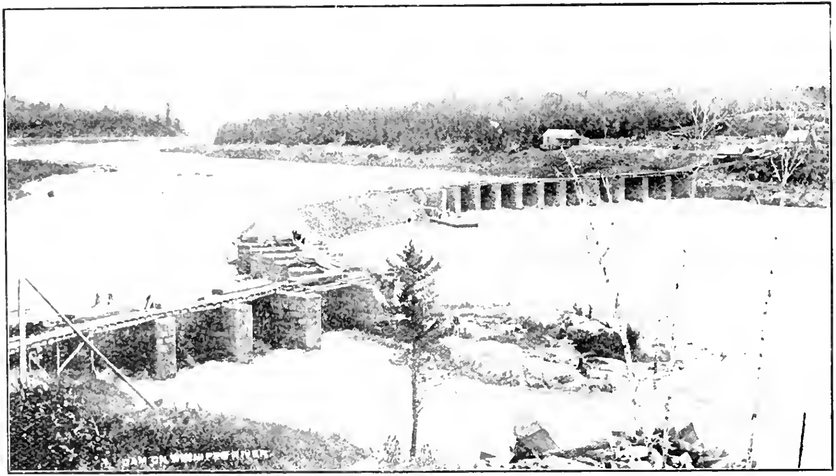
The work of railway building in the Province was very active during the year 1905, not many miles of new railway, however, were completed and opened for traffic.

The Grand Trunk Railway.—The G. T. R have continued the work of double tracking their line during the year and have completed the section on the southern division west of London. They have also spent large sums on the improvement of grades and alignment, and hope to have a maximum compensated three-tenths per cent. grade going east in the near future. To accomplish this will entail a very large expenditure.

The Canadian Pacific Railway.—The C. P. R. have under construction 228 miles of railway from Bolton, a station on the Owen Sound Branch, 27 miles west of Toronto to Romford, a station on the main line near Sudbury. They have also 88 miles under construction from Guelph to Goderich. Work is being pushed vigorously on both these lines and it is expected they will be completed and ready for traffic at an early date.

The company is continually expending large sums in improving its lines, in gradients and alignments, strengthening structures, construction of sidings, replacing trestles with permanent filing and other improvements.

James Bay Railway.—The James Bay Railway have prosecuted energetically the construction of their line between Toronto and Wahnapitae, a distance of 257 miles. Grading has been done from the 4th mile post from Toronto to mile post 146, James Bay Junction, a distance of 142 miles, also from mile post 148.5, Parry Sound, to mile post 170, and from mile post 190 to mile post 208, or a total length of grading during 1905 of 181.5 miles. The steel has been laid from Richmond Hill to Beaverton, a distance of 42 miles, also from James Bay Junction southerly 42 miles, and from Parry Sound northerly 5 miles, or a total distance of tracklaying 87 miles in length. The work of tracklaying is still in progress and the contractors for clearing and grading are at work between Parry Sound and Wahnapitae.



Dam on Winnipeg River at outlet of Lake of the Woods, Keewatin.

Central Ontario Railway.—Five miles of new track between Bancroft and Bird's Creek were under construction, and at the close of the year this distance was nearly all graded and about a mile of rails laid.

Manitoulin and North Shore Railwy.—The construction work on the Manitoulin and North Shore Railway during the year 1905 consisted of the erection of two steel plate girders over the Spanish River Pulp and Paper Company's power canal near Espanola, 70 feet and 51 feet in length respectively. It was anticipated that a further extension of the line would have been proceeded with, but definite arrangements have not yet been made.

Algoma Central and Hudson's Bay Railway.—Since last report the main line of the Algoma Central and Hudson's Bay Railway has been extended from Mile 64.5 to Mile 69. This extension of 4½ miles was completed previous to December 31st, 1905. A passing siding has been laid at Mekatina (Mile 64), also a Y at Mile 67.5, and a spur track at Mile 68.5, one-half mile in length. A further extension will be made of this spur in 1906. Permanent water stations have been erected at Searchmont, Ogidaki and Mekatina.

Grading has been completed and a considerable portion of the bridging done on the section of road between the North Chippewa River and the connection with the Michipicoten Division at Josephine Junction. The steel has not yet been laid on this section, but it is expected work will be resumed on this extension next year.

Temiskaming and Northern Ontario Railway.—At the end of the year 1904 the T. & N. O. was still in the hands of the contractors, who had been operating the sections between North Bay and Liskeard, a distance of 113 miles. Early in the month of January, 1905, the line was taken over by the T. & N. O. Railway Commission, who have put in operation a good service between the points named.

During the year 1905 the contractor has been operating the section between New Liskeard and Branche River for local traffic, a distance of 25 miles.

Grading has been completed to a distance of 80 miles north of Liskeard, the only deficiencies in these 80 miles are some four timber trstles and two small plate girders, which are all being erected as track-laying progresses. Tracklaying is completed to a point 40 miles north of Liskeard.

Location is completed to a point 105 miles north of Liskeard and beyond this 40 miles of trial lines have been carried to the neighborhood of the Transcontinental Railway location. The location of this portion will be completed during the present winter. Beyond this point an exploration party has examined as far as James Bay, and their report will be found in the annual report of the Commission for the year 1905.

REVISED STATEMENT OF RAILWAY MILEAGE IN ONTARIO.

No.	Name of Railway.		Terminal points. From	Terminal points. To	Completed prior to Confederation. Length in miles.	Completed since Confederation. Length in miles.	At present under construction. Length in miles.	Total length in operation of each railway or system of railways in miles.
1	Grand Trunk	Railway, Main Line	East Prov. Bound.	Point Edward	457			
2	do	Buffalo and Lake Huron Branch.	Fort Erie	Goderich	158			
3	do	London Branch	St. Mary's	London	23			
4	do	Galt and Doon Branch	Galt	Berlin	7	4.5		
5	do	Waterloo Junction Railway	Waterloo	Elmira		10.25		
6	do	Toronto and Nipissing Branch	Toronto	Coboconk		88		
7	do	Midland Railway, Main Line	Port Hope	Midland City	65	54.53		
8	do	do Peterboro' Branch	Millbrook	Lakefield	13	9		
9	do	Lake Simcoe Junction	Stouffville	Jackson's Point		26.5		
10	do	Whitby, Port Perry and Lindsay	Whitby	Lindsay		46		
11	do	Victoria Railway	Lindsay	Haliburton		55.81		
12	do	Grand Junction Railway	Belleville	Peterborough		61.65		
13	do	Belleville and North Hastings	Madoc Junction	Eldorado		22		
14	do	Toronto and Ottawa	Madoc	Bridgewater		9		
15	do	do Manilla Link	Wick	Manilla		6.5		
16	do	do Omemee Link	Omemee	Peterborough		14		
17	do	Port Dover and Lake Huron	Port Dover	Tavistock		55.68		
18	do	South Norfolk Railway	Simcoe	Port Rowan		17		
19	do	Chemong Branch	Peterborough	Chemong Lake		9		
20	do	Stratford and Huron	Stratford	Wiarton		106.27		
21	do	Owen Sound Extension	Parkhead	Owen Sound		12.40		
22	do	Georgian Bay and Wellington	Palmerston	Durham		26		
23	Grand Trunk Railway Great Western Div.	Main Line	Suspension Bridge	Windsor	229			
24	do	Toronto and Hamilton Branch	Toronto	Hamilton	39.5			
25	do	Loop Line Division	Glencoe	Fort Erie		145		
26	do	Kingscourt and Glencoe Link	Kingscourt	Glencoe		20.60		
27	do	Sarnia Branch	Komoka	Sarnia	51			
28	do	Petrolea Branch	Wyoming	Petrolea	7			
29	do	Brantford Branch	Harrisburg	Brantford	8			
30	do	Brantford and Norfolk	Brantford	Tillsonburg		35.88		
31	do	Lynden to Brantford	Lynden	Brantford		4 12		
32	do	Wellington, Grey and Bruce	Harrisburgh	Southampton	27	102		
33	do	do S. Extension	Palmerston	Kincardine		66		
34	do	London, Huron and Bruce	Hyde Park Junction	Wingham		69.75		

REVISED STATEMENT.—*Continued.*

No.	Name of Railway.	Terminal Points. From	Terminal Points. To	Completed prior to Confederation. Length in miles.	Completed since Confederation. Lengths in miles.	At present under construction. Length in miles.	Total length in operation of each railway or system of railways in miles.
35	G.T.R. Western Div.—Welland Railway	Port Colborne	Port Dalhousie	25			
36	Northern Railway, Collingwood Line	Toronto	Meaford	94	21		
37	do Muskoka Branch	Barrie	Gravenhurst		53		
38	do Hamilton and Northern, Main Line	Port Dover	Allandale		135.3		
39	do do do Collingwood	Clarksville	Collingwood		40		
40	do North Simcoe Junction	Colwell	Penetanguishene		33.34		
41	Northern and Pacific Junction Railway	Gravenhurst	La Vause		111.5		
42	Magnetawan River Railway	Burks' Falls Station, G. T. R.	Burks' Falls Village		1.01		
43	Toronto Belt Line Railway, Eastern Section	Don Station, G.T R.	Junc. Northern Ry.		8.50		
44	do Western Section	Carleton, on G. T. R.	Swansea		4.33		2,691.92
45	Canadian Pacific Railway, Main Line	Ottawa	West. Prov. Bound	57	1150		
46	do do	Ottawa	East. Prov. Bound		66.40		
47	do Algoma Branch	Sudbury Junction	Sault Ste. Marie		180.25		
48	do Brockville and Ottawa Railway	Brockville	Carlton Place	46			
49	do St. Lawrence and Ottawa Railway and Chaudiere Branch	Prescott	Ottawa	59.5			
50	do Ontario and Quebec Railway	Toronto Junction	East. Prov. Bound	12	281.25		
51	do do Don Branch	Main Line	Toronto		5		
52	do do Detroit Extension	London	Windsor		112.50		
53	do Credit Valley Railway, Main Line	Toronto	St. Thomas		119.13		
54	do do Orangeville Branch	Streetsville Junction	Elora and Orangeville		61		
55	do do Guelph Branch	Campbellville	Guelph		15		
56	do Toronto, Grey & Bruce, Main Line	Toronto	Owen Sound		122		
57	do do Teeswater Branch	Orangeville	Teeswater		72		
58	do do Wingham Branch	Glenannan	Wingham		4.75		
59	do West Ontario Pacific Railway	Woodstock	London		26		
60	do Atlantic and Northwest Railway	Renfrew	Eaganville		19.25		
61	do Lindsay, Bobcaygeon and Pontypool Railway	Burketon	Bobcaygeon		38.79		2,447.82
62	do Sudbury and Kleinburg Branch	Bolton	Romford			228	
63	do Guelph and Goderich Branch	Guelph	Goderich			88	
64	Michigan Central Ry., formerly Canada Southern Main Line	Windsor	Suspension Bridge		226.80		
65	do St. Clair Branch	St. Clair Junction	Courtright		62.2		
66	do Amherstburgh Branch	Amherstburgh	Essex Centre		15.7		

67	do Oil Springs do	Oil City Junction	Eddy's		5.2		
68	do Petrolea do	Petrolea Junction	Petrolea		4.9		
69	do Leamington & St. Clair Branch	Comber	Leamington		15.9		
70	do Fort Erie Branch	Welland Junction	Fort Erie		17.4		
71	do Niagara do	Fort Erie	Niagara	30			378.10
72	Canada Atlantic Railway	East. Prov. Bound	Ottawa		68.08		
73	do Ottawa, Arnprior & Parry So'nd Ry	Ottawa	Scotia		212.60		
74	do Parry Sound Colonization Ry	Scotia	Depot Harbour		51.20		
75	do Central Counties Railway	Glen Robertson	Hawkesbury		21		
76	do do do do	South Indian	Rockland		17		369.88
77	Cobourg, Peterboro' & Marmora Ry., M'mora Line	Cobourg	Harwood	14.5			14.50
78	Kingston & Pembroke Railway	Kingston	Renfrew		103		103
79	Prince Edward County Railway	Picton	Trenton & G.T.R.		32.44		32.41
80	Central Ontario Railway	Trenton at G.T.R.	Bancroft		95	5.00	95
81	Ontario & Belmont & Northern Railway	Central Ont. Ry.	Belmont Mine		9.57		9.57
82	Bay of Quinte Ry., formerly Napanee, Tamworth and Quebec	Deseronto	Bannockburn		78.45		
83	do Harrowsmith Branch	Yarker	Sydenham		11.37		
84	do Old Line	Deseronto	Grand Trunk Ry		3.5		93.32
85	Nosbonsing & Nipissing Railway	Lake Nipissing (S.E. Bay)	Lake Nosbonsing		5		5.00
86	Irondale, Bancroft & Ottawa Railway	Kinmount	Bancroft		15		45.00
87	Brockville, Westport & Sault Ste. Marie	Brockville	Westport		45		45.00
88	St. Catharines & Niagara Central Railway	Niagara Falls	St. Catharines		12.50		12.50
89	Lake Erie & Detroit River Railway	Walkerville	St. Thomas		126.85		
90	do Erie & Huron Railway	Rondeau	Sarnia		70.47		
91	do London & Port Stanley Railway	London	Port Stanley	25			222.32
92	Canadian Northern Ry., formerly Port Arthur, Duluth & Western Ry., and Ontario & Rainy River Ry., Main Line	Port Arthur	West. Prov. Bound		287		
93	do Duluth Extension	Stanley Junction	Gun Flint Lake		66.54		353.51
94	James Bay Railway	Canada Atlantic Ry	Parry Harbour		3.7		3.7
95	do Toronto & Sudbury Line	Toronto	Sudbury			265	
96	Toronto, Hamilton & Buffalo Railway	Waterford	Brantford		18		
97	do do	Brantford	Welland		62.5		80.50
98	Tillsonburg, Lake Erie & Pacific Railway	Ingersoll	Port Burwell		35.33		35.33
99	Ottawa & New York Railway	Ottawa	Cornwall		55.00		55.00
100	Pembroke Southern Railway	Pembroke	Golden Lake		21.50		21.50
101	Algoma Central Railway	Sault Ste. Marie	Michipicoten Junc		69	101.50	
102	do Michipicoten Branch	Michipicoten Harb	Main Line		22.10		91.10
103	Manitoulin & North Shore Railway	Sudbury	Gertrude Mine		13.50	5	13.50
104	Bruce Mines & Algoma Railway	Bruce Mines	Rock Lake		17		17
105	Temiskaming & Northern Ontario Railway	North Bay	Transcontinental Ry		113	90	113
				1,447.5	5,902.04	782.5	7,349.54

STATEMENT OF ELECTRIC RAILWAY MILEAGE IN ONTARIO.

From report of Department Railways & Canals to June 30th, 1904

Number.	Name of Electric Railway.	Length of Line. Completed.	Length of Line. Under construction	No. of Power Houses. Steam power.	No. of Power Houses. Water power.	Remarks.
1	Berlin and Waterloo	5.52	..		...	Power purchased from Berlin Light Commissioners.
2	Brantford Street Ry	7.00		1	....	
3	Cornwall Street Ry	6.00		1	1	
4	Galt, Preston and Hespeler. 9.00	.		.	...	
	Leased line Preston to Berlin 7.00	16.00	...	1	..	
5	Grand Valley, Brantford to Paris	6.00	14.00		..	Power hired from Brantford St Ry.
6	Guelph Radial	5.5	....	1	..	
7	Hamilton & Dundas	7.25			..	Power furnished by Cataract Power Co........
8	Hamilton, Grimsby & Beamsville	27.5		1	....	
9	Hamilton Radial	12.		1	...	
10	Hamilton Street Ry	22.		...	.....	Power rented from Cataract Power Co.......
11	International Transit Co., Sault Ste Marie	3.3			1	
12	Kingston, Portsmouth and Cataraqui Ry	7.5		1	....	
13	London Street Ry	31		1	.	
14	Metropolitan (Toronto)	29.		2	...	
15	Niagara Falls Park & River	13.68		1	1	
16	Niagara, St. Catharines & Toronto.	19.94		...	1	
17	Niagara Falls Wesley Park, Clifton	4.5		.	...	Power supplied by the Niagara, St. Catharines & Toronto Electric Ry.
18	Oshawa	8.02		1	...	
19	Ottawa	22.87		.	1	
20	Port Arthur Street Ry	9.00		1	1	
21	Port Dalhousie, St. Catharines and Thorold	6.82		..	...	
22	Sandwich, Windsor and Amherstburg	23.15		1	.....	
23	Sarnia St Ry	4.50		...	.....	Power hired.
24	St. Thomas St. Ry	....		....	.....	No report.
25	Toronto Suburban	8.5	...	1	....	
26	Toronto & Mimico	5.87		....	...	Power hired.
27	Toronto Street Ry	46.75		2	.....	
28	Toronto & Scarborough	5.07		..	....	Power hired.
29	Woodstock, Thames Valley and Ingersoll	11.50		1	..	

375.74 Total mileage Electric Railways in operation June 30th, 1904, in Province of Ontario.

Drainage Works.

The following municipalities have received aid in the construction of drainage works under the provisions of the Provincial Drainage Aid Act, 63 Vict., Chap. 8, during the year 1905:

Silver Creek and Castor River, Townships of Mountain and Osgoode.

This drain commences between lots 6 and 7 in the 10th concession of the Township of Mountain, and extends in a north-easterly direction to lot 17 in the 12th concession, where it enters the Castor River, then follows this stream which continues in a north-easterly direction to lot 31 in the 9th concession of the Township of Osgoode, a total length of about 18 miles. What is known as the Wylie Creek branch begins between lots 10 and 11 in the 10th concession of the Township of Mountain and extends in a northerly direction across said concession until it unites with the main drain a distance of nearly one mile.

The Engineer's estimate of the cost of this work was $24,008.12, assessed against the municipalities interested as follows:—

Township of Mountain	$12,462 62
" " Osgoode	10,955 63
" " South Gower	456 33
" " Winchester	133 54
Total estimated cost	$24,008.12

A grant was made towards this drain in the year 1902 to the amount of $2,400.00. The work has been proceeding since the year 1901 and is now well advanced towards completion. The above grant was revoted at the last session of the Legislature and has been paid to the treasurers of the several municipalities *pro rata* of the assessments.

Petite Castor and Annable Creek, Townships of Winchester and Russell.

This drainage scheme is designed to provide a good outlet for many large drainage works in the Townships of Winchester and Mountain. The estimated cost of the work as shown in the Engineer's report was $77,176.31; the actual cost will exceed this sum materially owing to increased cost of labor and to greater quantities of rock having been found than was shown on original plans.

The scheme includes a main drain commencing in the old channel of the Petite Castor River on lot 24 in the 8th concession of the Township of Mountain, and runs in a straight course north-easterly to the junction with Annable Creek on lot 7 in the 9th concession of Winchester; then follows as closely as practicable the present course of the river through the Township of Winchester and into the Township of Russell to lot 7 in the 4th concession, a distance of about 11 miles.

Annable Creek branch has a length of 3½ miles, branch No. 1 about 2½ miles, branch No. 2 about 1¼ miles, branch No. 3 about 1½ miles, or a total length of drains of about 19¾ miles.

The work on this drain is progressing rapidly, the amount of work done to the end of the year is about 200,000 cubic yards of earth excavation and 14,000 cubic yards of rock, at a cost of about $41,500.00.

The amount granted towards this work by the Legislature was $7,700.00. Of this grant $5,000.00 was paid in the year 1903. The balance, $2,700.00 has been revoted for the past two sessions and as the work is now so far advanced and is being carried on with energy the balance of the grant, $2,700.00, was paid to the treasurer of the Township of Winchester, the initiating municipality.

The area draining into this outlet is estimated at 46,000 acres, of which 5,500 were so wet as to be practically valueless.

Snake River Drainage, Township of Bromley.

As mentioned in the report of last year, the main item of cost in carrying out this drainage work was the payment of compensation to the owners for the removal of a mill-dam in the Village of Osceola on lot No. 20 in the 3rd concession of the Township of Bromley.

The estimated value of this dam by the Engineer was $13,500.00. The sum awarded by the court, however, was $20,000.00. Other work to be done consisted of two small rock cuttings and the removal of sunken logs, boulders and other obstructions from the stream.

A grant of $5,000.00 was paid towards this work in 1904. An additional grant of $2,700.00 was voted at the last session of the Legislature to relieve the ratepayers of a portion of the extra cost of the removal of the dam, as the assessments on the lands benefited were very high.

An examination of the work was made in the month of October, and as the dam had been removed and the other work was nearly completed, the amount of the grant, $2,700.00, was paid to the treasurer of the Township of Bromley.

The number of acres assessed for the work is 8,219 in the Township of Bromley and 210 in the Township of Wilberforce, exclusive of roads.

McGregor Creek, Township of Howard.

This work consists of opening up of a trunk outlet in the valley known as McGregor's Creek, from the west boundary of the Township of Orford westerly across the Township of Howard, and some 220 rods into the Township of Harwich, a total length of about 8¾ miles. The bottom width at the outlet is 15 feet.

The drainage area comprises about 18,000 acres as follows: 1,900 acres in Orford, 750 acres in Ridgetown, and 16,150 acres in Howard.

The estimated cost of the drains was $12,438.00. An inspection of the drain was made on the 11th of December, when it was found that the work was performed in a satisfactory manner. Only a small amount of work remained to be done. The amount of the grant was therefore paid to the treasurer of the Township of Howard, the initiating municipality.

Long Swamp, or Davidson's Creek, Township of Keppel.

The outlet of this drainage work is on lot No. 17, con. 4, Township of Keppel, into Davidson's Creek, and follows the course of the creek easterly and southerly through lots 17 and 18, concession 4, thence southerly through

lot 18, concession B, thence easterly and northerly through lots 19 and 20, concession B, to the easterly limit of lot 20. From this point a ditch has been dug easterly and northerly through the swamp on lots 21, con. B, 22, concession 4, thence easterly along the road allowance in front of the 2nd concession south of the centre diagonal to the line between lots 3 and 4, con. 2, S.C.D., and thence northerly along the line between lots 3 and 4, con. 2, S.C.D., and con. 1, S.C.D., to the centre diagonal road.

This drain is a main outlet for the drainage of about 2,000 acres in the Townships of Keppel and Derby. It has a length of a little over four miles. The work on the outlet consisted of a rock cut 8 feet in width, 3 feet in depth, and 1,680 feet in length; two other rock cuts occur in the last mile.

The work was inspected on the 5th of December and found to be performed in a satisfactory manner. The amount of the Legislative grant, $1,-500.00, was therefore paid to the treasurer of the Township of Keppel.

Pottawatamie River, Township of Derby.

This drainage scheme received aid to the extent of $3,000.00 in the year 1904. An additional grant of $500.00 was voted at the last session of the Legislature, which was paid to the Treasurer of the Township of Derby on the report of the Engineer that the work was fully completed.

I have the honor to be,

Sir,

Your obedient servant,

R. P. FAIRBAIRN,
Engineer Public Works.

REPORT OF THE SUPERINTENDENT OF COLONIZATION ROADS.

To the HONORABLE J. O. REAUME,
Minister of Public Works, Ontario:

SIR,—I have the honor to present a report of work performed under the Colonization Roads branch of your Department during the year 1905.

About 190 miles were opened as new roads and extensions, and seven hundred and seven miles or thereabout repaired and improved, representing a considerable amount of very permanent work, by gravelling and formation of the roads with grading machines and otherwise. Several small bridges were also built and repaired.

The various works are given in detail as follows:

EAST DIVISION.

Appleby Roads.—Three miles were improved in the township and one mile opened.

Amable Du Fond Bridge.—A bridge across the River in Calvin 150 feet long with five 20-feet spans and piers 16 feet high.

Addington Road.—Gravelling was done over three miles, and between Coyne and Massanoga Lake three miles were well repaired.

Alice 10 and 11 Con. Road.—One mile of excellent work in cutting down and improving heavy hills across lots 21, 22 and 23.

Airy Township Road.—Beginning at lot 12 and thence west to lot 9 in con. 5, three-quarters of a mile was opened and is valuable to settlers. A continuation of work to lot 15 and south to the first concession is desired.

Bexley, Laxton and Somerville Roads.—Repairs were made on Cameron Road between Coboconk and Laxton for three miles, and two miles improved on Monck Road from concession 7 to concession 8. Repairs were made on Bexley base line between Norland and Kinmount; and between Norland and Somerville excellent repairs were made covering many miles.

Bonfield Road.—Between concessions 8 and 9 across lots 25 to 26 three-quarters of a mile was fairly improved.

Boulter Township Roads.—From lot 26 between concessions 10 and 11 three-quarters of a mile of work was done, with a mile and a quarter of grading and ditching; and again between lots 30 and 31 through concessions 12 and 13 a mile and a quarter was opened.

Bridge at Boundary, Dunnet and Cassimir.—A small bridge was erected and two miles improved on the above-named boundary.

Broken Front and Mason Road.—Four miles repaired between concessions 2 and 3 of the Township of Mason.

Broder Dill and Long Lake Road.—Two miles well repaired and completed between Dill Township and Long Lake.

Badgerow Township Roads.—Between lots 6 and 7 two miles were improved; and between lots 8 and 9 and other roads, about three miles were repaired.

Beaver Creek Bridge.—A bridge was erected and another repaired.

Burton and Grant Road.—A good work reported for the expenditure.

Blezard, Hanmer and Capreol Roads.—More than two miles of work in Capreol and other named townships, with the construction of a bridge and approaches.

Bonfield, Boulter and Chisholm Roads.—On what is called South Shore Road, between Boulter and Chisholm, one mile was graded.

Bonfield 10 Con. Road.—One mile improved.

Bonfield and North Bay Roads.—From lot 4, con. 9 westward to lot 2, thence northward between concessions 2 and 3 to concession 10, two miles were improved, and on the 9th concession and over other portions two miles and a quarter were generally graded and ditched.

Boulter and Chisholm Road.—Ditching and grading three-quarters of a mile in the township of Boulter.

Booth Road.—In the township of Anstruther four miles were graded,

Burleigh and Apsley Road.—This road is about twenty miles in length between Burleigh and Apsley. The settlers on and near it are largely interested in cheese-making and it is desirable that the road be made in as permanent a manner as possible. One mile and a quarter was graded and covered with broken stone to a depth of 5 inches, making a most substantial job.

Bancroft and Coe Hill Road.—From Coe Hill northerly towards Wollaston and Faraday town line, grading, with some deviations about hills, was done along a length of five and a half miles.

Bancroft and Maynooth Road.—Six miles were repaired from four miles north of Bancroft to within five miles of Maynooth, including a deviation about "Bush Hill."

Buchanan and Petewawa Road.—Two miles, from lot 12, crossing lots 12, 13, 14 and 15 in the township of Buchanan were repaired.

Bell's Rapids Road.—An expenditure on the 5th concession line of Jones across lots 18, 19 and 20, repairing three-quarters of a mile.

Brudenel and Hagarty Town Line Road.—Across lots 14 to 18 both inclusive, some two and a half miles were repaired with some work on Brudenel and Killaloe Road.

Brudenel and Lyndoch Road.—Three miles of work across lots 307 to 312, both inclusive.

Battersea, Jones Falls and Morton Road.—From Jones Falls towards Battersea a mile and three-quarters were repaired, and between Leeds and Frontenac from Jones Falls two miles of excellent work is reported.

Battersea Road.—Broken stone was laid over a length of three-quarters of a mile and a quantity of timber removed.

Bedford and Scotch Line Road.—A road leading towards the boundary between Frontenac and Lanark and made for bout two miles.

Bell Rock nd Verona Road.—A mile worked over west of Bell Rock, and eastward, some broken stone was used with satisfactory results.

Bathurst and Althorp Road.—A branch to Bollingbrooke on boundary between Bathurst and Sherbrooke. Two miles of work were done upon it.

Burgess Narrows Road.—Between lots 13 and 15, concession 6, North Burgess, about a mile of improvements were effected.

Caldwell Road.—A mile and a half of road opened.

Cassimir Township Road.—Two miles of good work between concessions 4 and 5 and concessions 5 and 6, with an additional two miles opened, and a bridge built.

Cameron Township Roads.—On the Mattawa and Pembroke Road in the Township of Cameron from lot 4 to lot 35, Papineau, a mile and a quarter of good repairs were made and from lot 1, concession 10, Range A, upon the same main highway two miles were improved.

Calvin Township Roads.—Altogether nearly five miles of improvements were made in concessions 4 and 5 of Calvin and on the 12th concession of Papineau from lot 15 to lot 25.

Corbeilles and Callandar Road. A new portion of forty rods was opened between concessions 10 and 11 Ferris.

Chisholm Roads. From lot 19 to lot 21 of concession 18 three-quarters of a mile; on the 15th and 16th concessions a mile and a half; a mile on 12th and 13th concession line from lot 22; on the 10th concession line from lot 20 about three-quarters of a mile; another three-quarters between lots 25 and 26, concession 10; and between lots 4 and 10 in the 5th concession another three-quarters, with three-quarters opened on concession 4, over six miles altogether.

Carden Roads.—Gravelling was done over half a mile across lots 9 and 10, concession 2, and at lot 3, concession 1, gravelling was extended to lot 8, a length of a mile and a quarter. Two miles of work was done from lot 9 to lot 12, concession 2, Carden, and grading across lots 3 and 4 in the first concession; also on the 8th concession of Carden the road was gravelled from boundary of Eldon to lot 6, Carden, two and a half miles. A mile was improved between concessions 4 and 5 south of the first quarter line, and repairs continued south two miles, while on the Alsaw Road three miles were repaired from concession 6 west.

Cardiff, Dysart, Sherbourne and Stanhope Roads.—On Deer Lake Road in Cardiff north from lot 21 blasting and ditching was done to make the road more generally useful. Repairs were made in the same township between concessions 16 and 17 from Deer Lake to the Township of Faraday, altogether five miles and a quarter, and on Burleigh Road three miles and a half were improved from Monck Road south. The Peterson Road was repaired from Bobcaygeon Road eastward three miles and a half to lot 10, Minden, and upon the same road from Guilford west to Carnarvon nine miles were improved. Repairs were made from Peterson Road north to the concession line between 3 and 4 Guilford over two and a half miles. On Monck Road in Glamorgan two miles were worked over, and three and a half miles on Buckhorn Road from Gooderham to lot 24, concession 1, and with a new bridge 100 feet long built on lot 18, concession 5, completes the making of good roads.

Cavendish Roads.—Work on Buckhorn Road in Cavendish, chiefly brushing and widening the road along some ten miles.

Cordova Road.—Reported last year, but the account being then unpaid the sum granted lapsed, but was revoted this year.

Corundum Mine Road.—From Small's turn on Hastings Road and south towards Hybla a very rough section was repaired as far as the grant permitted.

California Road.—A road to Tamworth graded and ditched over three miles.

Clarendon, Westport and Mississippi Road.—From Clarendon Station south towards Westport three and a half miles of improvements were made.

Combermere and Barry's Bay Road.—Four miles brushed and repaired and two concrete waterways opened across the road.

Carlaw and Combermere Road. On the second concession of Raglan, crossing lots 4 and 5, the chief work was culling down and blasting a rocky hill and generally grading, improving the length.

Dunnet Township Roads.—The repair of three miles.

Dalton Roads.—Three miles gravelled from Sebright east to the third concession of Dalton and from lot 6 north and west to the boundary of Rama four miles were repaired.

Eldon Roads.—Between concessions 4 and 5, a length of seventy rods was filled with stone and gravel, and from Bolsover to boundary of Carden, on Dalrymple Road grading was done, and a bridge 100 feet long erected at lot 15, concession 5, Glamorgan.

Eganville and Perrault Settlement Road.—Three miles of substantial work, chiefly across lots 18 to 21 inclusive.

Field Township Roads.—On the 2nd concession across lots 1 to 4, two miles repaired.

Ferris Township Roads.—Three-quarters of a mile graded between concessions 8 and 9 on concessions 12 and 13; half a mile extending to meet a Government road and almost a mile on the 6 and 7 concession line to connect with main road, a mile and a quarter, also improved through lots 19 and 20, concessions 3 and 4.

Ferris and Widdifield Road.—From lot 40, concession 18, south, a mile and a quarter of largely new work.

Frontenac Road in Olden.—From the old Frontenac road, northward three miles and a half were improved, making now a fairly good highway.

Gibbon's Township Road.—Three miles opened in the township.

Garson Township Road.—A new road opened on the 1st and 2nd concession line of the township of Garson, a mile long.

Great Desert and Bonfield Roads.—A bridge built and half a mile of road opened.

Galway and Cavendish Road.—At lot 4, concession 10, a bridge was built over Union Creek, and north of Kinmount, some improvements were made upon the road.

Galway Roads.—On Bobcaygeon Road, north of Kinmount, two miles were repaired, and a mile and a half on White Lake road. On Swamp Lake Road two and a half miles were improved, and another mile on lots 1 and 2 in the 9th concession.

Glamorgan Roads.—On Buckhorn Road, north of Monck Road, a mile of work as a deviation about a hill on lot 24, concession 7, and further work on lot 25; again south and east from Buckhorn road to the 1st side road of Glamorgan, two and a half miles of repairs were made.

Golden Lake and South Algona Road.—Two and a half miles of work beginning at the Indian Reserve and crossing lots 10, 11, 12 and 13, south Algona.

Grattan, 6 concession Road.—Beginning at lot 12 and extending to lot 15, concession 6, a mile of work was done.

Hugel and Badgerow (Town line) Road.—This work was chiefly the breaking of a rocky ridge for drainage at the corners of Hugel, Badgerow, Creerar and Gibbons.

Hugel Township Roads.—Four miles of a rough road on concession 6, Kirkpatrick, were repaired, and a quarter of a mile on concession 2, between lots 1 and 3, Hugel.

Head, Clara and Maria Road.—On Pembroke and Mattawa Road from lot 10, concessions A and B to to lot 14 of Head, a mile and a half of good work was done.

Harvey Township Roads.—On Nogie's Creek Road 500 yards were filled, gravelled and graded. On Bobcaygeon Road two miles were well improved. Two miles were opened from Bobcaygeon road into Harvey, and on Gannon's Narrows road two miles were improved near Pigeon Lake, and done in connection with work by the municipality. A mile of brushing and grading on Sandy Lake and Buckhorn road. On Deer Bay road three miles were repaired, and on Buckhorn road about eight miles were more or less improved north or Cavendish.

Havelock and Cordova Road.—Over a length of eight miles grading and gravelling was done for a mile, the municipality furnishing a stone crusher, man and engine.

Herschell and Faraday Road.—Three miles substantially improved.

Hinchinbrooke Road.—Two miles and a half repaired, from Green Bay to Green Bay Road.

Hagarty 8th Concession Road.—Across lots 5 to 11, three miles were opened.

Hyde's Chute and Sanson Road.—A bridge was built over Doorley Creek and two miles repaired.

High Falls and Hartington Road.—From lot 4, concession 9, to lot 5, concession 12, some three and a half miles of the Hinchinbrooke road were repaired.

Holford and Desert Lake Road.—This work consists of 98 rods of brushing, ditching and gravelling.

Indian River Bridge.—The renewal of a bridge built 20 years ago in the township of Alice between lots 20 and 21, Range A. It is 100 feet long with 4 piers 8x18 feet and centre height 12 feet, and being of cedar will be a lasting structure.

Jenning's Township Road.—A mile repaired between concessions 4 and 5, and two and a half between 5 and 6.

Kirkpatrick Township Roads.—Between lots 8 and 9 a mile was opened with almost another mile of new work.

Lutterworth, Anson and Minden Roads.—Repairs were on Cameron Road from Laxton to Miner's Bay three and a half, and on Gull River Road from Anson to lot 18, five miles. Bobcaygeon Road from between Lutterworth and Snowdon from Miner's Bay Road to concessions 7 and 8, some five miles altogether were improved. Minden and Gelert Road was generally repaired over five miles and between Minden and Anson, the Bobcaygeon Road was improved over twelve miles. The Alsaw Road for three miles was improved and five miles of Peterson Road from Guilford west and three miles from Bobcaygeon Road east. The Monck Road in Glamorgan for a mile and a half was improved as also Buckhorn Road south from Gooderham.

L'Amable Station and Fort Stewart Road.—An important road from the township of Carlow which is well settled into the poorer townships of Mayo and Dungannon, reaching L'Amable station on the Central Ontario Railway. A diversion was made on lot 9, concession 7 of Dungannon, but striking the old road again at foot of Jamieson Lake, about eight miles received substantial repairs.

Long Lake and Opeongo Road.—Across lots 12, 13, 14 and 15 of concession 10, Ratcliffe, two miles of work was accomplished.

Loughboro' Road.—Gravelling from lot 14 to lot 17 of the 8th concession of Lougboro'.

Martland and Cosby Road.—Four miles and a half were repaired, and half a mile of crossing laid in Crosby and three miles on the 2nd concession of the township of Gibbons, towards McCarthy's bridge.

Mattawa and North Bay Road.—Some necessary repairs on the main road from Connely's corners east.

Monetteville Road.—On the boundary between Cosby and Martland expensive drainage was done and a mile of road opened in the 1st concession: and between concessions 3 and 6, Cassimir, three miles were well improved.

McPherson Township Roads.—Two miles of repairs and a mile and a half of road opened.

Mattawan Township Roads.—On the 6th concession, three quarters of a mile were repaired across lots 34 to 36 inclusive.

Mattawa and Bonfield Road.—The repair of a line between lots 9 and 10, Bonfield, through concessions 1 and 2 for three quarters of a mile, and between concessions 3 and 4 across lots 15 to 24 two and a quarter miles.

Mattawa and Pembroke Road.—In the township of Papineau from lot 19 to lot 20, Range B, a mile and a half repaired, and half a mile on the same road southward.

Moore Lake and Des Joachin Road.—Two miles put into excellent condition, between lot 34 to 48 on the main road to railway station in the township of Rolph.

Monmouth and Glamorgan Roads.—Abridge was built over Burnt River on the south Monmouth road and a waggon road opened for two miles to lot 23, concession 5. Four miles were repaired on Tory Hill road and a road repaired from lot 21 to lot 28, concession 14, Monmouth, three and a half miles.

Maymooth and Madawaska Road.—This work was chiefly opening a road between two settlements in the township of Wicklow, called "Steele" and "Cross Lake"; the length is estimated at about three miles chopped, 30 feet wide throughout.

McLean and California Road.—Cut out two miles from lot 19, concession 12, crossing through concessions 13 and 14, all in the township of Hinchinbrooke, and connecting two highways.

Neelon, Concession 5 and 6 Road.—Improvements through a bad swamp.

Nosbonsing Lake and Trout Lake Roads.—A mile of work through a swamp, ditching and gravelling the same.

Nosbonsing Station Road.—From lot 3 to lot 4 concession 5, Bonfield, half a mile of road opened.

Nosbonsing Lake and Corbeille's Road.—A mile and a quarter of work across lots 14 and 15 between concessions 7 and 8 of Ferris.

North Bay, Ferris and Widdifield Road.—From North Bay eastward three miles were repaired.

North Bay and Nipissing Road.—Three miles improved towards North Bay from Nipissing Junction, grading and ditching.

North Buckhorn Road. Improvements upon five miles in West Peterborough.

North Algona (6 Concession) Road. Across the fronts of lots 3, 4 and 5, about a mile was improved.

Oak Lake Road.—In the township of Methuen, over a length of about eight miles, a mile and a half of grading and draining was effected.

Opeongo Road.—In the township of Brudenell, one mile was repaired from Range B to lot 30, Range A.

Papineau Township Roads. On the 11th concession of Papineau, from lot 4, three-quarters of a mile of ditching and grading, and from Broom Creek west, half a mile of good work.

Papineau 12th Concession Road.—Three quarters of a mile opened from Gillighan's School house eastward; and on the 8th concession between lots 8 and 10, three-quarters of a mile were repaired.

Parham and Arden Road. Beginning at concessions 4 and 5 near boundary of Kennebec and Olden, from lot 19 to lot 21, half a mile was opened, graded, ditched and largely gravelled; and from the boundary between Kennebec and Olden a mile of marsh was gravelled with a foot of material, together with three-quarters of a mile of repairs toward Arden.

Petewawa Road. On the 16th concession of Petewawa between lots 10 and 11 a heavy hill was cut down and a swamp filled in to a depth of 18 inches, making a very permanent improvement. A bridge was also raised and a new culvert built.

Portland and Loughboro' Road.—A mile and three-quarters made and covered with broken stone over nearly half its length.

Ratter Township Roads.—Three miles of very permanent repairs, and on the Sudbury and Warren Road four miles were well improved which, with other work, represents eight and a half miles.

Renfrew and Admaston Road. A work begun but unfinished at the time of the inspector's last visit and closing of season.

Springer Township Roads. Four and a half miles of work, namely, a mile and a half opened on A concession, two miles on the first concession, and a mile on Larder Road.

Smoky Falls Road.—An uncompleted work awaiting winter, when the balance can be done more advantageously.

Snowdon Road. On what is known as "Dutch line" three miles were graded, and a mile and a half of repairs made from lot 1 to lot 7, Snowdon township.

Snider Township Road.—Three miles of excellent work.

Sudbury and Warren Road. A good winter road opened from lot 15, Markstay, four miles in length, and in Ratter township half a mile.

Stony Lake Road.—Chiefly the re-planking of an old bridge with permanent stone filling at ends.

Snow and Lavant Road.—Three miles worked over from about a mile and a half west of Lavant, grading and ditching the entire length, and making, the inspector says, a first-class job.

South Algona Roads.—Between concessions 1 and 2 three-quarters of a mile opened across lots 10 and 11, and a mile across lots 13 to 15 inclusive in the 5th concession; also on the 11th concession across lots 26, 27 and 28, three-quarters of a mile.

Stafford Township Road.—A work between Alice and Stafford representing about two miles of repairs.

Sunbury and Inverary Road.—Two very bad hills were thoroughly repaired, putting the road in generally good condition and not requiring, the inspector says, any further Government expenditure.

Sydenham Lake Road.—A road opened between concessions 8 and 9, Loughboro', from lot 14 to lot 17, three miles or thereabout, to provide a much shorter route to Factories.

Tamworth and Arden Road.—From the boundary between Kennebee and Sheffield a mile and a half was worked over and improved.

Victoria Road.—North of Uphill through Digby and Dalton, seven miles were repaired, and south of Uphill from concession 2, Digby, four miles.

Warren Road.—A mile of heavy hills on the boundary of Cosby and Martland were thoroughly improved.

Warren and Crerar Road.—Three miles repaired in the township of Ratter.

Widdifield Roads.—Beginning at lot 22, concession A, a mile and a half of fairly good repairs were made.

Widdifield Concessions 2 and 3 Road.—From lot 16, concession 1, east, one mile, and between lots 14 and 15 northward to concession 5, five miles of good work as reported.

Wellington Road.—About six miles of repairs and grading south-easterly from the Village of Apsley.

Wollaston Township Road.—Between Maynooth and Combermere the worst portions were made passable and on the main road the balance of the grant was spent, making three miles of repairs altogether.

White Lake Road.—This work was across lots 16, 17, 18, concession 10, Pakenham, and across lots 21 to 23, concession 8, altogether a mile and a half.

Wilberforce Roads.—A mile repaired across lots 29 to 31 in the 18th concession, and two miles from lot 17 westerly between concessions 18 and 19. Satisfactory improvements were made from the town line between South Algona and Wilberforce westward for nine miles. A mile of good work was done on the 5th concession line and half a mile on the 16th concession.

Wylie Township Road.—Between lots 5 and 6 a good work was done in building cross ways and bridges, about a mile and a half of work.

North Division.

Atwood and Spohn Road.—The chopping and clearing 40 feet wide of a road from the east corner of 29 and 10 north for a mile and three-quarters. The length was grubbed 24 feet wide and ditched upon one side.

Aberdeen Bridge.—A structure 87 feet long on the 3rd concession entirely renewed as a pile bridge.

Algoma Mills and Blind River Road.—A work begun a mile north of Blind River on the boundary between Cobden and Striker at the point between concessions 1 and 2 of Cobden, and opened from thence east into Striker nearly three-quarters of a mile. The balance of the length will be cheaper to construct than the above portion.

Ansonia and Lefroy Township Road.—Repairs, with the opening of half a mile from what is called "Pike's Corners" to Thessalon River, some two miles.

Aweres Township Road.- Some three miles opened from section 2 to meet a road previously opened by the Government, approximately between sections 27 and 28 and 33 and 34.

Blue, Pratt and McCrossen Road.—From near the south corners of sections 10 and 11, Blue Township, a mile and a quarter was opened and largely crosswayed and double ditched.

Barrie Island and Mills Township Roads.—On Barrie Island a mile of good work was done across lots 4 to 7 between concessions 3 and 4, and in Mills Township three miles were repaired on the main road from the north boundary southward.

Balfour Township Road.—On the first concession a bridge was built over Wilson's Creek. Twelve piles 35 feet long were driven, leaving an opening of 25 feet. Length of bridge, 60 feet, and cost about $215. A road was also built from concession 4 to concession 6, two miles.

Bellingham and Iron Bridge Road. Two and a half miles of grading, making very permanent improvements.

Blind River and Martain Lake Road.—On the boundary between Cobden and Striker from concession 2 of the latter township, about two miles were opened north, graded, ditched and made good for general traffic.

Beaudreau and Gold Rock Road.—From Gold Rock on Upper Manitou Lake to Beaudreau Landing on Lake Wabigoon, seven miles were repaired, including the renewal of several small bridges and culverts.

Blake Township Road.—A work between lots 10 and 11, concession 1, and being half a mile of grading with a machine, the property of the municipality of Paipoonge.

Bright, 5th Concession Road.—About two miles of grading and crosswaying, and excellent work reported. This road is between Dean Lake Station and Iron Bridge through Bright and Gladstone.

Carpenter, 2nd Concession Road.—Between lots 6 and 7 from concession 3 to 5 inclusive over a mile and a half of brushing, grubbing, and ditching was done.

Campbell Township Roads.—Three-quarters of a mile of improvements between lots 7 and 9, concession 2; one mile in the 8th concession across lots 23, 24 and 25; and between Gore Bay and Providence Bay in the townships of Gordon and Campbell three miles.

Carnarvon and Tehkummah Road.—There were eight miles well improved between Providence Bay and Manitowaning in the townships of Carnarvon and Tehkummah.

Cockburn Island Roads.—A mile of logging, underbrushing and grading on concessions 9, 10 and 12.

Derlin and Burris Road.—Chiefly in Burris township three and a half miles of excellent improvements are reported.

Dilke and Nelles Road.— Between sections 32 and 33 and north into Nelles one hundred rods of corduroy were laid, and total length of over three-quarters of a mile made a good general highway.

Drury, Denison and Graham Roads.—Seven miles of clearing, grading and ditching between Victoria Mine and Whitefish through the townships named.

Dorion Township Roads.—Between lots 8 and 9 through concession 3, and across lot 8 between concessions 3 and 4 a mile and a half was opened, and other work done to assist in giving access to the railway.

Day Mills and Dayton Road.—Altogether, over three miles and a quarter were well improved between Day Mills and Dayton Station, and is the main road between these points.

Dryden to G. T. P.—About four miles opened, beginning midway between lots 6 and 7, concession 5, Wainwright, following appromimately the lot line named to the corners of 6 and 7, and 5 and 6; thence angling to the north town line of Wainwright, thence along town line to line between lots 4 and 5, thence between 4 and 5 to the division between concessions 2 and 3 of Breton, and further cut out to Gull River in the third concession.

Dunns' Valley Road Bridge.—A structure one hundred feet long with pile piers and 4 stringers and having a width of 14 feet roadway.

Eton, Aubrey and Sanford Roads.—Much work was done in the townships of Aubrey and Sanford, chiefly through concessions 3 and 4 of the latter township and on the 6th concession of Aubrey, altogether, six miles were improved.

Espanola Road.—Two and a half miles of clearing, ditching and grading from Espanola west on the main road.

Fort Frances and Emo Road.—From the west corner stake of sections 23 and 26 Devlin east, 568 rods were graded and 273 rods corduroyed, and, including work from Lavallee Bridge east, represents four miles of excellent work.

Fort William and Stanley Road.—A road between concessions 2 and 3 of Paipoonge, and concessions 3 and 4 of Neebing. Four miles of its length between Stanley Bridge and Fort William were thoroughly improved, including a large amount of tap drains and ditching.

Galbraith Township Road.—The ditching through a swamp two miles long and the road covered with the material from the ditches, thus forming a good highway between the 2nd and 3rd concessions.

Gillies Con. 5 Road.—The chief expenditure was upon Silver Mountain Road, but repairs were made near Hymer Village and between lots 9 and 10, concession 5, covering some six miles.

Gordon and Allan Roads.—Between Long Bay and Gore Bay, Manitoulin Island, two miles were repaired.

Goulais Bay Road.—Designated last year Vankoughnet Road, as generally on the town line between Pennefether and Aweres, Korah and Tarentorus. It has been further opened, graded, corduroyed, ditched, gravelled and improved over its length of six and a half miles. This road is now generally used instead of the old Batchawaing Road, being shorter and more direct for all general purposes.

Honora and Little Current Road.—Two miles repaired of the main road in the township of Howland, Manitoulin Island.

Howland and Bidwell Township Road.—The town line between Bidwell and Billings was improved, and from concession 6 to concessions 8 and 9, four miles of repairs.

Havilland and Fenwick Township Road.—A bridge was built over Stockton Creek in Fenwick, and in Havilland on section 37 seventy-three rods were opened to Havilland Bay. Fifty-one rods were also opened between Vankoughnet and Tupper, and thirty rods of a hill on section 6, Vankoughnet, were well repaired.

Isbester Station Road.—Two miles of grading from the Government road north to the railway in the township of Laird.

Kagawong and Gore Bay Road.—From Gore Bay to Kagawong in the township of Allan five miles were well improved by grading, ditching and stone filling.

Korah Township Roads.—Half a mile was gravelled on the old Goulais Bay road from the 2nd line of Korah north to sections 27 and 28.

Lavalle and Burris Roads.—From the north east corner of sections 22 and 23 Burris northward, nearly a mile was cut out and 26 feet of the width grubbed, and three bridges were built aggregating a length of one hundred and thirty feet.

Lake Wolsey Road.—General repairs in the township of Gordon southward towards Meldrum Bay, with repairs on the 6th concession of Burpee, altogether about three miles.

Laird Township Roads.—Two miles of grading from between sections 7 and 8 south and northward on the same line.

Lefroy Township Roads.—From section 14 through a rough stony section four miles of chopping, grubbing and gravelling.

May Township Road.—A continuation of Webbwood and Massey Road. Three-quarters of a mile was opened between concessions 5 and 6, with half a mile of other work on the same line.

Mather and Kingsford Town Line Road.—Two miles and a half opened and half the length well graded.

Morley and Pattullo Town Line Road.—Along sections 32, 33, 34, of Morley, and section 3, 4, 5 of Pattullo, six miles opened and improved.

Morley Township Road.—Five miles of work from the line between sections 9 and 10 west, across the township.

McIntyre and Neebing Town Line Road.—A mile and a half opened on the south side of block 67, the municipality giving $35.00 to assist in the work.

Mutrie Township Road.—A road from Dryden into Mines, and repaired over two miles.

Meldrum Bay and Silverwater Road.—From the town line of Dawson at lot 31 to lot 45, and opposite lots 25 and 26, four miles of improvements were made and two more upon other portions.

McDonald, Meredith and Aberdeen Road.—Altogether about four miles of general improvements, made up of half a mile of gravelling on Echo Bay road, two miles on side road south, a mile from between Meredith and McDonald west between sections 21 and 28, and south between 27 and 28, with half a mle in Meredith at section 28.

Manitoulin Island Roads. A total of some nine and a half miles gravelled, graded and otherwise improved, the chief works being sixty rods of filling on the 3rd and 4th concessions of Assignac, and between concessions 5 and 6 a ditch forty rods long was dug out and a culvert constructed. Four hundred and sixteen loads of gravel were laid on the main Government road, and thirty rods graded. On lots 7, 8 and 9, concession 5, one mile was repaired and one hundred and fifty rods of gravelling on main road. Five and a half miles of the same road with half a mile of grading. Sixty rods were chopped and grubbed on concession 17, and twenty-five rods on the 16th concession, while on the town line between Assignac and Sheguiandah, one hundred and sixty loads of gravel were laid.

Mellick and Jaffray Roads.—This work was from the north limit of Kenora (Rat Portage) through the townships of Jaffray and Mellick, reaching to lot 12, concession 3, of the latter township, and covering some nine miles of improvements.

Oliver 7 Con. Road.—Beginning between Oliver and McIntyre between lots 6 and 7 Oliver, and thence east into McIntyre across lots 32 to 25 general work was done over three and a half miles, consisting of turnpiking, crossway'ng and grading with necessary culverts.

O'Conner Township Roads.—A grant spent almost entirely building bridges in the township. Five having been renewed and repaired.

Plummer Township Road. The opening of half a mile with three-quarters of a mile of grading on the 3rd concession. On Block A of the same township half a mile was opened and grubbed.

Plummer Additional and Lefroy Road.—Two miles of work from the C. P. Railway crossing eastward.

Prince Township Roads.—On the 4th line half a mile was stumped, graded and ditched to the school house. On the 5th line seventy-five rods of crosswaying were laid, and in connection with a bridge erected over Carp Creek nine hundred and fifty-three cubic yards of earth filling.

Patton Township Road.—A work between Patton and Gladstone, chiefly ditching along nearly four miles.

Paipoonge Roads.—The various works in Paipoonge, are: (1) Beginning at the N. W. corner lot 35, concession A, and intrseetien with lot 35, concessions B and C, work was continued south between lot 35, concession 1 and concession C to about centre of said lot 35, clearing and grubbing one mile. (2) A bridge of a temporary character built at small cost and subject to destruction by annual freshets, it is between concessions 4 and 5, lot 9. (3) From lot 6, concession C, across lot 6, 7, 8 and 35 of concession 4, about a mile was opened of heavy bush, and a bridge 414 feet long repaired. (4) The construction of a bridge on the E and F concession and completed up to the stone filling of cribs which for lack of funds could not be done. (5) Half a mile between lots 15 and 16 was cleared 40 feet wide, and stumped 20 feet wide. (6) The excavation of a heavy hill to prevent the destruction of the road into O'Connor, caused by the freshets of Whitefish River, and (7) From lot 21 to lot 25, between concession 1 and A, grading and general improvements were made, a machine being supplied by the municipal council.

Rainy River Road.—Grubbing, grading and crosswaying across lot 32 to 35, 29 and 30 in the township of Worthington.

Rayside Township Roads. Between concessions 3 and 4 forty rods of crosswaying and three-quarters of a mile of grading was done; also on the 5th concession, between lots 9 and 10, almost half a mile was opened, grubbed and graded.

Rydal Bank and Ophir Road. Eighty-two rods of ditching, a mile north-east of Ottertail bridge, through a swamp.

Scoble Township Road. On the town line between Scoble and Gillies, and in Gillies, on the 1st and 2nd concessions, lots 1, 2 and 3, some two miles of improvements were made.

Sanfield and Tehkummah Road. Three hundred rods of chopping, grading and gravelling on Sanfield Lake Road and a mile gravelled on Tekhummah Slash road. A bridge was also repaired over Blue Jay Creek at a cost of about $190.00.

St. Joseph Island Roads.—Several portions of roads were materially improved, chiefly by grading and gravelling, namely: From the 5th side line eastward fifty rods; the K line from A line to lot 10, eighty rods; between concessions F and G one hundred and thirty rods; from 20 side line to K line two hundred and fifty rods; on W and X line; from W line to Tenby Bay, ninety-one rods, and through concessions 10 and 11 to Biggar's Bay, sixty-five rods.

Snider Township Road.—Work was done on lot 1, concession 6, Snider consisting of four bridges, costing about $60 each, with the approaches; and from Copper Cliff on the main road about two miles were repaired.

Spanish Station Road.—Between the townships of Victoria and Shedden, ending at Spanish Station, three miles of grading and crosswaying; and from Graham's Mill to "Crab lane", thence north one mile and south half a mile, two miles and a half were opened and improved.

Silver Mountain Road.—The opening of a road between lot 35 and A and C Paipoonge, forty rods of corduroy were laid.

Stanley Road and Bridge.—A deviation from the line between concessions A and B, Paipoonge was made owing to the impracticable character of the existing road, the new route having been surveyed by the municipality, length a mile and a half from lot 33, south 10 chains, and thence east to lot 27. A portion of the bridge was raised and grading and filling in approaches well done.

Tait and Richardson Road.—Five miles opened in the township of Tait, between sections 33, 34, 26, 27, 23, 24, 15, 16, and 15 and 21.

Tait and Mather town line Road.—Fifty chains, were opened and fully graded through a low section, requiring an eighth of a mile of crosswaying. A mile was also opened between sections 13, Tait, and 18, Mather.

Tarbutt Road.—A mile and a quarter of grading and ditching, the latter being along a mile of the whole length.

Thessalon and Dayton town line Road.—On the above mentioned road a mile and a quarter was repaired.

Third and Fourth Concession Line, Gladstone.—Commencing at the town line between Patton and Gladstone, and thence westward a mile was opened with necessary crosswaying and culverts.

Temiskaming Roads.—In this district, for which $20,000 was voted in the estimates and a subsequent allowance by the Treasury Board of $9,500, about twenty-eight miles of road were opened and eighty-three or thereabout further improved, the words being generally the following: (1) Two and a half miles opened on or near the town line of Savard and Marquis, deviating therefrom in some instances for a better location. (2) On the 4th line of Armstrong towards Hilliard, one mile was opened; (3) and between Hilliard and Harley, three-quarters of a mile cut out and partially graded. (4) About ten miles worked over in the townships of Evanturel and Dack, between Heaslip and Charlton Post offices, the chief work, however, being one mile of grading. (5) On the 5th concession of Hudson from lot 7, one mile west was cut out, grubbed and graded. (6) Bucke and Firstbrooke road was repaired; (7) and on the road from Haileybury to Cobalt, about four miles were opened. (8) Again on Bucke and Firstbrooke road 506 rods of crossway were laid, with culverts also, and the cutting down of a heavy hill. (9) On the 6th concession of Kearns from West Road, one mile, each east and west was chopped and grubbed. (10) In the township of Kearns, a mile and a half of chopping, grubbing and grading; (11) and on the line

between lots 2 and 3 of the last named township, a mile was opened and half-graded from front of concession 2, north. (12) Between Hudson and Dymond, from concession 4, one mile was graded; (13) and between Harley and Hilliard, from lot 5 west, two miles were graded half width, with ditching upon one side almost the entire length. (14) A bridge was constructed at lot 5 on West Road, Hudson and reported an excellent structure. (15) On the 2nd concession of Harley, a small amount of work was done; and (16) in the township of Brethour, from its south boundary north between lots 6 and 7 four miles and a half were chopped and logged, two and a half of which were grubbed. (17) In Armstrong township from Carlton east to lot 3, Hilliard, five miles were further opened and half the distance grubbed; (18) and grading and ditching west from Carlton of two miles. Grading was done over about 28 miles upon various roads with a grading machine which is most valuable work where it can be used. The following contracts were let and work carried out: For the cutting and stumping on the south boundary of Savard from the line between lots 6 and 7 west to its westerly boundary three miles, at $400 per mile. A contract for similar work on the south boundary of Armstrong from the west boundary of Hilliard West, two miles at $440 per mile. A contract for the construction of a number of small bridges, aggregating a length of 2,105 feet, all within the townships of Dack and Chamberlain. The cost of all these bridges was $344 per running foot. A contract was also given to build several bridges on Long Lake Road, south of Long Lake, having a total length of eight hundred and thirty-six feet; also a bridge over Sunday Creek on the same road, a pile structure raised 6 feet above the creek banks with main span of 42 feet and length 220 feet and rock approaches. Another structure, "Burnt Bridge" was repaired, re-covered, and with a new main pier cost $280.

Tarentorus Township Road.—In sections 21 and 22 half a mile of a heavy clay swamp was stumped, graded and gravelled, making a hitherto almost impassable portion an excellent highway. Beaver Creek bridge was temporarily repaired as a present necessity.

Victoria and Sugar Lake Road.—A road opened through a new district for a length of a mile and three-quarters and chopped 60 feet wide.

Vanhorn Township Road.—Six miles cheaply opened, giving many settlers and miners access to their lands.

Water's Township to Nairn Village.— Commencing on the town line between Snider and Waters, and thence westward; again between lots 2 and 3, concession 6; 4 and 5, concession 5; and 6 and 7, concession 4 of Waters, four miles were grubbed, ditched and generally improved.

Well's Township Road.—A mile and three-quarters of pretty heavy work was done from a bridge at foot of Ansley Hill to Haggart's Corners.

Webbwood and Whitefish Road.—Between lots 2 and 3, concession 4, township of Lorne, a mile was opened, and on the line between Lorne and Nairn, across lot 12 to concession 5, and lots 9, 10, 11, concession 6, three miles; with another mile across lot 8, concession 1 Drury. Also from lot 1, concession 4, Nairn, continuing through bush, four miles and a half were opened, with half a mile across lot 2, concession 4, leading to Vermillion Falls. Half a mile of grading was done between lots 8 and 9, and a mile and a quarter on the town line of May and Salter. Another mile was graded and stumped, aggregating a mile and a half of new road and one and a quarter of repairs.

West Division.

Armour Side Line Road.—Between lots 5 and 6 a mile and a quarter was opened.

Ahmic Harbor and Rae's Road.—Repairs from Orville to Seguin Falls, about a mile, and the building of a bridge.

Armour Road.—On the 12th concession half a mile of general grading to complete a job previously begun and upon which about $300 were spent.

Bethune, Concession 2 and 3 Road.—Between lots 10 and 20, a mile and a half of improvements.

Bethune, 10 Side Line Road.—Two good bridges were built, one on lot 1, concession 10, the second on lot 4 of the same concession, and the balance of the appropriation upon the 8th concession line in repairing three-quarters of a mile.

Balsam and McKellar Township Road.—Two miles of good work between lots 25 and 26 through concessions 5 to 7.

Byer's Road.—On the side line between lots 5 and 6, between concessions 12 and 14, a mile was opened.

Blackstone Road.—Work from lot 12, concession 12, to lot 11, concession 10, Foley, amounting to two miles and a half.

Beggsboro' Mills and Rainy Lake Road.—In the township of McMurrich, a new road was opened on lots 14 and 15 in concession 12, a mile and a quarter long.

Booth Line Road.—A mile and a half of road was opened and thoroughly ditched from Matchedash township, through north Orillia. It is stated that heretofore settlers had to pack their supplies to Orillia, but are now much relieved.

Baxter and Gibson Road.—From lots 31 to 39, a mile and a half of work, and from near the town line of Gibson into Wood another mile and a half.

Cardwell, Watt, Humphrey Road.—Some five miles of repairs from lot 42, concession 8, Watt, to lot 27, concession 8, Cardwell.

Chaffey, Cardwell Road.—From lot 24, concession 6, Chaffey, to lot 20, concession 8, a mile and a half of improvements were made. Again from lot 21, concession 12 northward to Axe Lake, a mile and a quarter was improved, and from lot 26, Chaffey, on the main road two miles were well improved with another three-quarters of a mile of repairs made from lot 12, concession 5, to lot 15, Cardwell.

Christie Township Road.—Repairs in Christie of a mile and a half between Parry Sound and Orville.

Christie Road.—In the township of Foley was repaired for a mile and a half between lots 4 and 11.

Croft Bridges.—The re-planking of a bridge between lots 30 and 31 in the 11th concession of Croft.

Dillingport Road.—A road passing through the township of Darling in a diagonal manner and the main highway. The work was chiefly building a bridge over Shebeshkong River.

Distress River Road.—In the township of Chapman, beginning between lots 10 and 11, concession 9, and finishing in the 8th concession, about a mile of blasting and general work over a hilly section.

Draper, Ryde and Oakley Roads.—A bridge was built at lot 6, con. 10, Ryde, originally 130 feet long, but filled at the ends with 35 cords of stone, reducing the opening to 35 feet. In Oakley Township from lot 21, con. 4, to lot 3, con. 6, general grading and repairs were made over about five miles.

Dalton and Washago Road.—A mile and a half repaired in Dalton from lot 28 westward to Rama, and from Monck towards Carden repairs were made. Some 200 loads of gravel were hauled 3 miles and used upon the roads, indicating good work.

Edgington and Orange Valley Road.—A mile of repairs.

Franklin and Sinclair Road.—Between lots 9 and 15 about two miles of general repairs, and from bridge over Boyne River, lot 11, con. 10, to lot 7, con. 6, some three miles were more or less improved.

Foley and Conger Road.—A new road on lots 30 and 31, con. 10, and lot 31, con. 11, Foley, opened for three-quarters of a mile to give Conger settlers a way to Parry Sound.

Great North Road.—Better known as Northern Road, was repaired from concessions 3 and 4 McKenzie, two and three-quarter miles to Deer River, and in the township of Ferguson through the east corner three and a half miles were improved.

Hagerman Road.—Forty-four rods of crosswaying between lots 8 and 9.

Himsworth, 9th Concession Road.—Between concessions 8 and 9 from lot 23 westward a mile and three-quarters of work reported as well done.

Little Doe Lake and Croft Road.—First opened in 1885. This season repairs were made in Chapman over about three-quarters of a mile.

Lindsay and St. Edmunds Roads.—General improvements over main roads in the above two townships between Lion's Head and Tobermory, on the Indian Peninsula of the County of Bruce.

McDougall and Parry Sound Road.—On lots 11 and 12, concession 4, and on lot 20, concession 2, in the township of McDougall, a mile and a half of general repirs were mde.

McMurrich Township Roads.—On the 30th side line in concession 1, and also in the 10th concession, an estimated length of two miles was improved; and on the 20th side line one hundred and eighty rods were opened anew.

Macaulay, McLean, Ridout Roads.—From the town line between McLean and Macaulay five miles were repaired eastward, and two miles westward.

Morrison, Muskoka, Medora Roads.—In Muskoka township from lot 30, con. 9, west to lot 19, con. 11, substantial repairs were made over three and a half miles, and on Muskoka Road from lot 7 towards Severn Bridge three miles were graded with a machine and put into excellent condition, while in the township of Morrison from lot 19, con. 8, and about Kilworthy Station two miles were improved.

Machar Township Roads.—On the 5th side line of Machar a mile and a quarter was opened through a difficult section across two concessions.

Mills, Wilson, McConkey Road.—From the east side of lot 6, McConkey, west across front of said lot a road was cut out, and from thence again westward to within a mile of Pickerel River the road was very much improved for a length of over two miles, and largely new work.

Monck Road.—From Sebright to lot 16, Rama, and from lot 18 to lot 23 in Mara; again east of Sebright to the 3rd line of Dalton, improvements

were made covering altogether a length of about nine miles. The municipality furnished a stone-crusher to aid in the work.

Monteith and Parry Sound Road.—From between lots 5 and 6, con. 10, a mile was opened to concessions 8 and 9 in the township of Monteith.

Monteith Township Roads.—Repairs from lot 11, con. 10, to lot 12, a mile of repairs, and a mile and a half between lots 3 and 4 from the 2nd to the 4th concession.

Matchedash Roads and Bridges.—In the township work was done on the 3rd and 4th side line between concessions 5 and 6, settlers doing a large amount of additional work; and at the lower end of the same line between con. 1 and town line a third of a mile was graded and two culverts introduced. "Wray's Bridge" and that on "Gallagher's line" were repaired. A road was opened to a bridge near con. 5 on the town line between Orillia and Matchedash. One hundred dollars were spent on the last-named town line in conjunction with some labor by settlers, and lastly on the 3rd concession the road was graded and gravelled from the 4th and 5th side line to Orillia and Matchedash town line.

Muskoka Road.—Through concessions 9 and 10, Morrison, almost a mile was graded and formed into a good general highway.

Neville and McDougall Township Road.—This work was on lots 11 and 12, con. 4, McDougall, a mile of improvements.

North-West Road.—In the township of Sheguiandah improvements were begun at con. 1 and continued to lots 14 and 15, two and a quarter miles.

Nipissing Township Road.—Between lots 15 and 16 half a mile was opened and repairs made between Nipissing Village and Commanda for a mile and three-quarters.

North Road.—Two miles of good work in the township of Pringle to united with Golden Valley Road.

Nipissing Road.—Between Sequin and Cardwell from north end of Cardwell township to lot 8, Monteith, four miles of repairs were made, and in Spence township between concessions 4 and 11 six and a half miles were improved.

Otter Lake Road.—A road in the township of Foley repaired on lots 20 and 21, con. 3, a mile of substantial work.

Orange Valley Road.—A road between Orrville and Sequin Falls through Christie township. Three-quarters of a mile of work in clearing, crosswaying and grading, practically new work.

Perry, 11th Concession Road.—A brige was built near Scotia Junction with a span of 28 feet and height of about 9 feet, which with approaches represent a length of five hundred and fifty-one feet of filling and grading.

Ryerson, 8th and 9th Concessions Road.—Between lot 19 to lot 22 three-quarters of a mile were well improved.

Rosseau and Edgington Road.—Between lots 13 and 14, con. 1, Christie, a mile of grading, with some necessary repairs on lot 81, Humphrey, on the Parry Sound Road.

Stephenson and Watt Road.—On Muskoka Road, between lot 15, con. 7, townships of Stephenson and Watt, to half a mile north of Utterson, about six miles were well improved.

Stisted and Brunel Road.—From lot 1, con. 7, to lot 19, con. 9, Brunel, about four and a half miles of general improvements were made, and in the

township of Stisted from lot 30, con. 9, west to lot 33, con. 7, two miles and a half of further repairs were done.

Stisted and McMurrich Road.—About two and a half miles of work altogether, consisting of forty-six rods on the 4th concession and the balance between lots 14 and 15 in con. 9 to within a quarter of a mile of Sprucedale.

Spence Township Road.—On the road allowance between lots 20 and 21 through concessions 7 to 9, two miles and a half were opened.

Strong Township Road.—Sixty rods of gravelling between concessions 10 and 11, Strong, upon a deviation secured by the municipal council for the improvement of the highway.

Strong and Machar Town Line Road.—Grading one mile of a new road which, when finished, will give settlers access to South River.

Strong Township Bridge.—Built over Magnetawan River on con. 2, Strong, and understood to be good substantial work.

Trout Creek and Commanda Lake Road.—From between lots 70 and 71 of concessions A and B, Gurd, and to lot 74 on the Rosseau and Nipissing Road, a mile of repairs were made.

Westphalia Road.—On the 4th concession of Himsworth eastward, a mile and a quarter of a rather rough section was repaired to Trout Creek.

Wolf River Road.—A work in the township of Mills between lots 27 and 28, concession 14. Three-quarters of a mile were opened.

White Oak Creek Bridge.—A new structure in the township of Humphrey costing somewhat less than the estimated sum, $300.

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.

Name of work.		Expenditure.
East Division.		
Airy Township	road	$200 05
Appleby and Dunnett	"	307 22
Appleby and Jennings, concessions 5 and 6	"	150 00
Appleby and Jennings, concessions 4 and 5	"	100 00
Amable and Du Ford bridge and approaches	bridge	499 31
Addington road, Kaladar north	road	448 64
Addington road, 2nd section	"	449 98
Alice, 10th and 11th concession road	"	304 90
Appleby & Dunnett, 1904 balance	"	17 15
Alice road, 1904 balance	"	85 10
Alice and Wilberforce, 1904 balance	"	53 25
Bexley—Cameron road	"	300 77
Bexley—base line road	"	100 00
Bexley—Laxton, 8th and 9th concessions	"	100 12
Bexley—Laxton, Somerville road	"	256 34
Bexley—Fenelon Falls and Kinmount road	"	251 50
Bonfield, 8 and 9	"	140 00
Bonfield, 9 and 10	"	117 00
Boulter, lots 30 and 31	"	302 03
Bridge, boundary Dunnett and Cassimer	bridge	297 04
Broder and Dill	road	305 27
Broder and Long shore road	"	286 74
Badgerow, concessions 6 and 7	"	299 92
Badgerow Township, from lot 14 to concession	"	200 13
Badgerow Township, Doults concession	"	151 13
Badgerow Township, LaBrosse road	"	250 00
Badgerow to Desaulniers	"	410 71
Bear Creek bridge	bridge	300 00
Burton and Grant road	road	149 50
Blezard Township road	"	493 00
Blezard—Hanmer, concession 1, between 9 and 10	"	149 97
Blezard—Capreol, concession 3, lots 4 and 5	"	509 97
Blezard—Hanmer, concession 2, between lots 5 and 6	"	350 00
Bonfield—Boulter, south shore road	"	300 00
Bonfield, 10th concession road	"	306 00
Bonfield & North Bay road	"	110 30
Bonfield and North Bay, from Bonfield to 10th concession	"	306 54
Bonfield west to boundary Ferris	"	280 00
Bonfield, lot 4, concession 9, west, to lot 2	"	196 30
Boulter and Chisholm road	"	301 55
Booth road, Anstruther	"	201 62
Burleigh and Apsley road	"	900 75
Bancroft and Coe Hill road	"	499 50
Bancroft and Maynooth road	"	600 89
Buchanan and Petewawa	"	300 00
Bell's Rapid road	"	247 75
Bonnechere River bridge	bridge	350 00
Brundenell and Hagarty	road	435 55
Brundenell, Lyndoch and Foymount	"	402 40
Battersea, Jones Falls and Morton, 1st section	"	212 75
" " " 2nd section	"	298 32
Battersea road	"	248 27
Bedford road	"	200 00
Bell Rock and Verona road	"	201 00
Bathurst and Althorpe	"	250 96
Burgess Narrows road	"	230 00

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of works.		Expenditure.
EAST DIVISION.—*Continued.*		
Boulter Township road	road	$302 58
Broken Front and Mason road	"	307 63
Brougham road, 1904 balance	"	80 00
Booth road, 1904 balance	"	10 11
Cassimer Township, between 5 and 6	"	300 75
" " " 4 and 5	"	209 12
Cameron Township, between Papineau and Cameron	"	255 74
" " from western boundary	"	250 00
Caldwell Township road to bay	"	505 96
Cameron Township, B Range	"	51 00
Cameron Township side road	"	51 00
Chisholm Township 10th side line	"	396 62
" " 4th to 6th concession	"	305 78
" " opening 5 side road from concession 8	"	303 92
" " 15 side line	"	130 00
Calvin Township, from Calvin siding east	"	250 00
Calvin Township, from lot 22, concession 4	"	127 90
Calvin Township, from town line Bonfield and Calvin	"	127 00
Calvin Township, lot 30 and 32	"	151 75
Corbeilles and Callender road	"	152 59
Chisholm 12th concession road	"	127 62
Chisholm 20 side line	"	150 00
Chisholm and Bonfield road	"	203 00
Chisholm and Ferris	"	279 60
Carden road south to Balsover	"	197 75
Carden 4th and 5th concession road	"	150 38
Carden 8th concession road	"	146 37
Cardiff—Dysart, Burleigh road from lot 12, concession 12	"	199 42
Cardiff—Deer Lake road	"	199 98
Cardiff—Dysart, concessions 16 and 17 to eastern boundary	"	100 28
" " Grit road round Boskung Lake	"	300 27
" " Peterson road east	"	200 82
" " Peterson road west	"	201 25
" " Northwest road to Peterson road	"	149 95
" " Dorset and Hollow Lake bridge	bridge	480 00
Cavendish road	road	199 90
Cordova road, Hastings	"	400 00
Corunda Mine road	"	399 70
California road to Tamworth	"	300 00
Clarendon, Westport and Mississippi road	"	501 62
Combermere and Barry's Bay road	"	497 50
Carlow and Combermere road	"	284 44
Cordova road, 1904 balance	"	34 74
Central road, Loboro, 1904 balance	"	30 20
Cosby road, 1904 balance	"	20 08
Calvin road, 1903 balance	"	24 75
Combermere and Maynooth, balance 1904	"	15 69
Dunnett Township, Brule road	"	300 00
" " Lamarche road	"	150 00
Dalton Township, Monck road, Sebright	"	301 50
" " Sadowa road	"	100 00
" " Johnston's quarter line road	"	100 37
District Line road, 1902 balance	"	17 75
Eldon 3rd quarter line road	"	145 00
Eldon, Balsover and Dalrymple road	"	150 30
Field Township to Desaulniers road	"	253 56
Field road	"	311 13

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of work.		Expenditure.
EAST DIVISION.—*Continued.*		
Ferris 10 and 11 road	road	$202 47
Ferris 12 and 13 road	"	150 38
Ferris concession 8 and 9 road	"	300 77
Ferris and Widdifield road	"	247 15
Ferris 6 and 7 road	"	300 29
Ferris 20 and 21 road	"	417 69
French line road	"	106 85
Frontenac road, 1st section	"	200 18
" " 2nd section	"	200 84
French River road, 1904 balance	"	5 00
Ferris and Widdifield road, 1904 balance	"	13 00
Ferris and Chisholm road, 1904 balance	"	4 50
Field road, 1904 balance	"	20 00
Gibbons Township road	"	299 80
Garson Township road	"	193 00
Great Desert road	"	304 85
Galway and Cavendish road	"	197 15
Galway roads	"	298 80
Golden Lake road	"	311 23
Gratton 6th concession road	"	399 40
Griffith road, 1904 balance	"	25 65
Hugel and Badgerow road	"	521 51
Hugel Deer Lake road	"	401 00
Hugel and Kirkpatrick road	"	413 25
Head Clara and Maria road	"	406 00
Harvey Township road, 1st section	"	400 00
" " 2nd "	"	392 15
Havelock and Cordova road	"	321 38
Herschell and Faraday road	"	400 70
Hinchinbrooke road	"	298 15
Hagarty, 8th concession road	"	399 95
Hyde, Chute and Sanson	"	395 80
High Falls and Hartington road	"	203 61
Holleford and Desert Lake road	"	200 00
Hanmer road, 1904 balance	"	20 04
Hugel and Badgerow, 1904	"	56 56
Indian River bridge	bridge	389 48
Inspection		5,282 96
" 1904 balance		1,116 40
Jennings Township road	road	405 95
Jones Falls and Morton, 1904 balance	"	49 29
Kirkpatrick, concession 4, lots 5 and 6	"	100 00
" " 3	"	200 06
" " 2, between 8 and 9	"	200 24
Kennaway road	"	200 91
Keenanville road, 1904 balance	"	20 20
Lutterworth, Anson and Minden Allsaw road	"	100 00
" " Minden and Gelert "	"	293 00
" " River road from Lutterworth boundary	"	199 09
" " Bobcaygeon road north of Minden	"	501 25
" " Lutterworth and Minden S. boundary	"	101 17
" " Bobcaygeon between Minden and Kinmount	"	249 90
Locating roads, Nipissing, balance 1904	"	42 36
L'Amable Station and Fort Stewart road	"	300 57
Long Lake and Opeongo road	"	265 15
Loboro road, lots 14 and 17	"	200 50
Martland and Cosby road	"	195 84
Martland Township to Bartrand road	"	296 87

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of work.		Expenditure.
EAST DIVISION.—*Continued.*		
Martland, 11 and 12 road	road	$150 00
Martland and Cosby, concession 2 road	"	252 75
Monetteville road to Cosby boundary	"	506 67
Monetteville road	"	510 20
Moore Lake and DesJoachim road	"	299 95
McPherson, concession 5 road	"	500 00
McPherson and Kirkpatrick road	"	299 02
Mattawa and Bonfield road	"	200 03
" " concession 1 to concession 2	"	100 00
" " from Connolly's Corner E	"	101 00
" and Pembroke from town line E	"	191 35
" " B. range	"	52 87
" and Calvin bridge repairs	"	15 00
Monck road east to Sebright	"	300 00
" between Rathburn and Atherley	"	200 00
Monmouth and Glamorgan, Haliburton road	"	100 00
" " Tory Hill road	"	96 52
" " bridge at S. Monmouth	"	405 66
" " Buckhorn road south	"	449 50
" " Paisley road south	"	99 97
" " Buckhorn road N. of Gooderham	"	50 50
Maynooth and Madawaska road	"	400 00
McLean and California	"	300 00
Mattawan Township road	"	181 00
Mattawa and Temiskaming road, balance 1904	"	16 45
" Township road, balance 1902	"	11 75
Mattawatchan bridge, balance 1904	"	11 60
Neelon, concession 5 and 6	"	295 00
Nosbonsing Lake and Trout Lake road	"	202 98
" Station road	"	176 50
" and Ferris road from concession 4	"	70 00
" Lake and Corbeilles Crossing road	"	205 00
North Bay, Ferris and Widdifield road	"	200 00
" and Junction road	"	209 00
Narrows bridge approach	bridge	200 00
North Buckhorn road	road	293 49
" Algona, 6th concession road	"	325 91
" Harvey road, balance 1904	"	79 61
Oak Lake road	"	203 09
Opeongo road	"	409 25
Papineau Township road from Boom Creek	"	152 53
" B. range road	"	159 59
" 12th concession road	"	200 00
" 8th "	"	196 87
Parham and Arden road, Addington	"	246 00
Petewawa, concession 16 road	"	248 97
Parham and Arden road, Frontenac	"	511 10
Portland and Loboro road	"	304 01
Queen's Line road	"	99 71
Quadville and Perrault road	"	400 30
Ratter Township road, Warren to Deer Lake	"	150 00
Ratter, concession 1 to Hagar boundary	"	348 78
Renfrew and Admaston road	"	363 18
Ross Township road, balance 1904	"	20 55
Round Lake road, balance 1904	"	52 06
Springer Township, Larden road	"	195 40
" concession 1 road	"	199 69
" Bidal road	"	200 00

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of work.		Expenditure.
EAST DIVISION.—*Concluded.*		
Springer Township, concession A road	road	$197 52
Smoky Falls road	"	401 82
" and Grant road	"	92 75
" and Lagennesse road	"	350 38
Snider Township road	"	396 02
Sudbury and Warren road, from lot 13	"	375 40
" " " 6, concession 4	"	401 00
Stony Lake road in Dummer	"	199 50
Snow and Lavant road	"	514 70
South Algona, concession 3, lots 13 and 16	"	208 90
" " 10 and 12, lots 26 and 29	"	199 50
" " 1 and 3, lots 10 and 11	"	203 50
Stafford District line road	"	300 00
Sunbury and Inverary road	"	303 16
Sydenham Lake, east side, road	"	230 63
Snowden roads	"	150 00
Sharbot Lake road, balance 1904	"	100 63
Springer " 1904	"	20 50
S. Algona " 1903	"	26 40
Tamworth and Arden roads	"	253 61
Victoria road between Uphill and Victoria	bridge	500 43
" south of Uphill	road	400 00
Vasa Creek road	"	144 93
Verner bridge, balance 1904	"	25 00
Warren road in Dunnet	"	498 41
Wasa bridge, balance 1904	"	64 48
Wolseley bridge, balance 1904	"	30 40
Warren and Crerar road	"	200 00
Widdifield, concessions 2 and 4, road	"	600 90
Wellington road, Chandos	"	200 38
Wollaston road	"	300 41
Wilberforce, 5 proof line road	"	301 13
" 10th and 15th concession road	"	198 15
" 22nd "	"	348 70
" 16th "	"	199 42
" 12th "	"	207 90
" 18th "	"	106 65
Wylie Township road, 8th concession	"	199 92
Widdifield Township road	"	200 20
White Lake road	"	205 38
		70,430 95
NORTH DIVISION.		
Atwood and Spohn	road	990 00
Algoma Mills and Blind River	"	500 00
Aberdeen, 3rd concession	bridge	302 90
Ansonia, Lefroy Township	road	499 47
Aweres Township	"	296 13
Blue, Pratt and McCrosson Townships	"	989 46
Barrie Island	"	250 95
Barrie Island and Mills Township	"	250 24
Balfour Township	"	450 00
Bellingham, and Iron Bridge	"	490 00
Blind River and Martain Lake	"	499 78
Blake Township	"	193 49
Bright, concession 5 to Iron Bridge	"	510 81
Beaudreau and Gold Rock	"	387 54

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of work.		Expenditure.
NORTH DIVISION.—*Continued.*		
Carpenter, 2nd concession, lots 4 and 7	road	$820 27
Campbell Township, 1st section	"	250 00
" 2nd "	"	450 28
" 3rd "	"	249 95
Carnarvon and Tehkummah	"	700 90
Cockburn Island	"	298 91
Carpenter, 6 and 7, balance 1904	"	206 72
Connee Township "	"	128 04
Devlin and Burriss	"	993 00
Dilke and Nellis	"	495 01
Dunn's Valley	bridge	224 75
Drury, Denison and Graham	road	591 39
Day Mills and Dayton	"	501 25
Dryden to G. T. P.	"	995 52
Dorion Township, lots 8 and 9	"	500 00
" balance 1904	"	159 30
Espanola	"	490 00
Eton, Aubrey and Sanford	"	532 84
Eagle River, balance 1904	bridge	585 42
Fort Frances and Emo	road	994 56
Fort William and Stanley	"	1,939 32
Gillies, concession 5 road	"	480 00
Gorham and Ware locating road	"	32 00
Goulais River bridge	bridge	550 00
Gordon and Allan	road	364 69
Gordon Lake	bridge	196 50
Goulais Bay	road	1,945 74
Galbraith Township	"	402 18
Honora and Little Current	"	692 57
Howland and Bidwell, 1st section	"	201 00
" " " 2nd "	"	395 00
Haviland and Fenwick	"	391 00
Hymer's road, balance 1904	"	313 11
Isbester Station	"	497 21
Inspection		2,957 55
Inspection, balance 1904		655 91
Kagawong and Gore Bay	road	750 19
Korah Township	"	399 93
Lavallee and Burns	"	964 37
Lake Wolseley	"	399 58
Laird Township	"	500 00
Lefroy " from section 14	"	500 64
Manitoulin roads, Assignac Township	"	750 00
Mather and Kingsford town line	"	1,016 53
Morley and Ball	"	84 45
Morley and Pattullo	"	981 40
Morley Township	"	1,008 45
Meldrum Bay and Silverwater	"	745 00
MacDonald, Meredith and Aberdeen	"	499 42
Melleck and Jaffray	roads	1,008 42
McIntyre and Neebing	road	195 00
Mutrie Township	"	186 59
May, 5th concession	"	297 99
Mine Centre	"	300 00
Mather and Tait, balance 1904	"	19 69
Mather and Dobie, " "	"	104 55
Morley and Shenston, " "	"	15 56
McGregor Township, " "	"	221 37

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of work.		Expenditure.
NORTH DIVISION.—*Concluded.*		
McIntyre Township, balance 1904	road	$314 87
Nelles and Pattullo, " "	"	19 72
Oliver, 7th concession	"	380 00
Ottertail Lake	bridge	500 11
O'Connor Township	road	298 31
Plummer and Lefroy	"	300 00
Prince Township	"	498 90
Plummer Township, block A	"	104 03
Paipoonge, concession C east	"	405 86
" and Stanley	bridge	153 12
" repairing Babcock	"	150 27
Plummer, 3rd concession	road	299 75
Paipoonge, repairs	bridge	400 20
" concession, E and F	road	591 60
" lots 15 and 16	"	294 28
" side road lots 20 and 21	"	292 59
" and O'Connor, balance 1904	"	409 77
Patton Township	"	275 71
Rydal Bank and Ophir	"	100 00
Rayside Township	"	518 38
Rainy River road, Aylesworth	"	467 02
Rapid River and Rainy River	"	480 00
Roddick and Crozier, balance 1904	"	113 58
Roddick and Carpenter, " " Freight account		29 25
Scoble Township	road	415 80
Sanfield and Tehkummah	"	500 00
St. Joseph Island, Hilton Township	"	334 00
" " Jocelyn Township	"	332 25
" " St. Joseph Township	"	332 73
Spanish Station	"	483 07
Silver Mountain	"	288 05
Stanley bridge. East	bridge	400 00
Stanley bridge approach	"	165 00
Snider Township	"	400 41
Scoble and Blake, balance 1904	road	501 72
Tait and Richardson	"	980 00
Thessalon and Dayton town line	"	200 00
Tait and Mather town line	"	544 73
Third and Fourth concession road, Gladstone	"	300 00
Tarentorus	"	367 50
Tarbutt, between lots 4 and 5	"	521 00
Victoria road to Sugar Lake	"	499 07
Van Horne Township	"	521 67
Wells "	"	399 41
Whitefish, "protecting from jam"	bridge	40 25
Waters Township to Nairn	road	746 85
Webbwood and Whitefish	"	999 28
" " Massey	"	499 82
Covering for Grading Machine, Thunder Bay	"	8 39
		$57,923 11
Less refund St. Joseph Island road		38 25
		$57,884 86
WEST DIVISION.		
Armour, 21 side line road	road	200 00
Ahmic Lake road, Croft	"	54 00

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of work.		Expenditure.
WEST DIVISION.—*Continued.*		
Ahmic Harbor and Rae's Mills	road	$200 00
Armour, 12th concession	"	200 62
Bethune, concession 2 and 3	"	200 88
Bethune, 10th side road	"	308 97
Balsam road, McKellar	"	200 00
Byers road, Nipissing	"	300 75
Blackstone road, Foley Township	"	199 45
Beggsboro' Mills, McMurrich Township	"	299 91
Booth Line	"	799 99
Baxter and Gibson in Gibson	"	200 59
" " " road in Baxter	"	200 00
Cardwell, Watt and Humphrey	"	400 45
Chaffey and Cardwell, east from lot 36	"	200 00
" " " Williamsport	"	200 00
" " " in North Cardwell	"	101 44
Christie Township	"	199 90
Chaffey and Cardwell, South Cardwell, lot 12	"	200 47
Christie, 11th concession	"	200 00
Croft road and bridge, lots 30 and 31	"	300 00
Dillingport road, Carling	"	199 81
Distress River road, Chapman	"	200 00
Draper and Ryde, town line between lots 16 and 26	"	299 85
" " " Clear Lake from lot 21, Oakley	"	250 87
" " " Bridge, lot 6 to concession 10, Ryde	bridge	171 50
Dalton and Washago	road	300 25
Edginton add Orange Valley, Christie Township	"	200 82
Franklin and Sinclair road in Franklin	"	301 11
" " " " in Sinclair	"	200 39
Foley and Conger	"	201 37
Great North road, Maple Island to Bear River	"	300 00
" " " in Ferguson	"	200 00
Golden Valley road bridge, Pringle	bridge	396 68
Hagerman, 8 and 9	road	200 00
Himsworth, concession 9	"	399 30
" balance 1904	"	22 38
Lindsay and St. Edmunds	"	201 02
" " " East	"	100 00
" " " West	"	100 50
Little Doe Lake	"	199 00
McDougall and Parry Sound	"	299 44
McMurrich Township, 30 side line	"	198 00
" " 20 " "	"	200 53
Macaulay and McLean, from town line	"	400 70
" " Draper " " "	"	300 00
" " " Baysville, lot 28, concession 10	"	158 04
Morrison, Muskoka, between Bala and Gravenhurst	"	175 37
" " " " " Whiteside	"	175 00
" " Long Point	"	300 51
Machar Township	"	510 25
Morrison Township	"	302 77
Mills, McConkey and Wilson	"	501 33
Montieth and Parry Sound	"	299 85
Montieth Township	"	199 37
" " Bear Lake to connect Perry	"	199 49
Matchedash	roads and bridges	600 00
Muskoka, Ardrea North	road	400 00
Mequimokong, balance 1904	bridge	46 10
Nipissing road, Chapman and Lount	road	200 00

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES IN THE YEAR 1905.—*Continued.*

Name of work.		Expenditure.
West Division.—*Concluded.*		
Neville road, McDougall Township	road	$200 40
Northwest, Shawanaga	"	204 40
Nipissing Township, lots 15 and 16	"	294 69
North road, Pringle Township	"	199 94
North Himsworth, 5 side line	"	93 71
Nipissing road, Seguin to Cardwell	"	198 50
Nipissing road in Spence Township	"	203 42
Otter Lake road, Foley Township	"	199 90
Orange Valley, Orville to Seguin Falls	"	199 37
Perry, 11th concession, lots 15 and 16	"	173 40
Ryerson, concession 8 and 9	"	210 24
Rosseau and Edgington	"	203 69
Stephenson and Watt, through Stephenson Township	"	399 99
" " " " Watt "	"	414 34
Stisted and Brunel	"	292 62
" road, lots 30 and 31, concessions 9 and 8	"	295 00
" and McMurrich	"	195 80
Spence Township, side line, lots 20 and 21	"	300 77
Strong Township, concessions 10 and 11	"	198 57
" and Machar town line	"	195 26
" Township, concession 2	bridge	204 85
Trout Creek and Commanda Lake	road	199 65
Tay and Severn	"	300 25
Westphalia, Trout Creek East	"	200 20
Wolfe River road, Hardy and Mills	"	298 23
White Oak Creek bridge, Humphrey	"	294 00
Inspection	"	1,256 15
" balance 1904	"	300 50
		$22,785 46
Temiskaming District.		
Armstrong and Hilliard, lots 6 and 7 east	road	1,999 86
" " " from Earlton west	"	944 47
" concession 2 and 3, to Long Lake, 1904	"	463 75
" road, ditching	"	64 75
" south boundary from west boundary of Hilliard	"	1,020 25
Bucke and Firstbrook from Haileybury west	"	504 97
" " " westerly half	"	500 38
Bridge and approaches, Ada Creek	bridge	947 20
Burnt bridge	"	280 00
Brethour, along lines 6 and 7	road	1,398 52
Casey and Harris	"	122 75
Dymond and Hudson, boundary from concession 4	"	101 86
Evanturel, 3 and 4, 1904	"	22 75
Grading roads through district	"	553 80
Hudson, concessions 4 and 5, from lot 7 west	"	501 94
Hudson Creek	bridge	186 49
Hilliard and Harley town line from west limit	road	978 99
Harley, between concessions 2 and 3	"	149 91
Haileybury and Cobalt (departmental expenditure)	"	931 65
" " " balance 104	"	417 13
Kearns and Armstrong, boundary from lot 7	"	409 32
" concession 6 from lot 4	"	150 00
" Township, between lots 2 and 3	"	250 00
" 4th and 5th concession line	"	101 33
" concessions 5 and 6	"	100 28

SUMMARY OF EXPENDITURE ON COLONIZATION ROADS AND BRIDGES FOR THE YEAR 1905.—*Concluded.*

Nature of work.		Expenditure
Temiskaming District.—*Concluded.*		
Locating, balance 1904	roads	$29 04
Moore Creek bridge repairs, 1904	bridge	43 50
Harley road contribution	culverts	250 00
North road	road	589 73
Long Lake road, bridges north of Long Lake	bridges	6,300 26
" " " " south " " "	"	1,890 54
" " "	road	1,972 26
" " " stumping	"	220 00
Repairing bridges, balance 1904	bridge	6 00
Savard, south boundary	road	900 00
Savard and Marquis	"	500 57
Sutton Bay	"	100 00
Wright's Creek	bridge	90 00
West road, balance 1904	"	55 50
Sunday Creek bridge and approaches	"	1,162 00
		$27,211 75
Recapitulation.		
East Division		$70,430 95
North "		57,884 86
West "		22,785 46
Temiskaming District		27,211 75
Departmental Expenditure		$178,313 02
Municipal and Other Grants.		
LaRose Mining Company, to Haileybury and Cobalt road		$500 00

HENRY SMITH,
Superintendent Colonization Roads

Department of Public Works.
Toronto, December 31st, 1905.

STATEMENTS

OF THE

ACCOUNTANT

AND

LAW CLERK

Department of Public Works, Ontario.
Toronto, January, 1906.

Hon. J. O. REAUME,
Minister of Public Works, Ontario.

SIR:

I have the honor to submit the following statements of maintenance and capital expenditure on public buildings, works, roads, aid to railways, etc., and of contracts entered into in connection therewith, being: (1) the expenditure on Maintenance and Repairs account for Government and Departmental Buildings, Institutions and Works for the year 1905; (2) the capital expenditure for public buildings, works, roads, railways, etc., for the year 1905; (3) the total capital expenditure on public buildings, public works, colonization and mining roads, aid to railways, etc., from the 1st of July, 1867, to 31st December, 1905; (4) a classified statement showing (a) the expenditure for four years and six months, from 1st of July, 1867, to 31st December, 1871; (b) the expenditure for thirty-four years from 1st January, 1872, to 31st December, 1905; and (c) the grand total of expenditure from 1st July, 1867 to 31st December, 1905; and (5) a statement showing the several contracts and bonds entered into with His Majesty during the year 1905 for the execution of sundry works under the control of the Department.

I have the honor to remain,

Sir,

Your obedient servant,

J. P. EDWARDS.

Accountant and Law Clerk.

STATEMENT No. 1.

Being statement of expenditure, on Maintenance Account for fuel, electric light, power, gas, water, vault fittings, furniture and furnishings, repairs, salaries, etc., for the following Departmental Buildings and Institutions and Works during 1905.

Name of Service	Amount.
Administration of Justice.	$ c
Osgoode Hall, Toronto	11,722 64
Education.	
Normal and Model Schools and Educational Department, Toronto	11,126 71
Normal and Model Schools, Ottawa	1,105 51
Normal School Buildings, London	2,788 00
School of Practical Science, Toronto	17,461 26
Maintenance and Repairs of Government Buildings.	
Parliament and Departmental Buildings (including salaries of engineers, firemen, messengers, etc.) and furnishings Legislative Chamber and Speaker's apartments	52,082 23
Attorney-General's Department	672 55
Crown Lands Department	3,280 56
Treasury Department	871 32
Public Works Department	1,193 51
Provincial Secretary's Department	2,158 65
Agricultural Department	885 19
Government House	11,889 87
Superintendent Locks, Dams, Bridges, etc	1,200 00
Lockmasters', Bridgetenders', and Caretakers' Salaries	4,380 00
Total	129,121 08

J. P. EDWARDS,
Accountant.

Department of Public Works, Ontario.
Toronto, February, 1906.

STATEMENT No. 2.

Being statement of expenditure, Capital Account on Public Buildings and Works, etc., for the year 1905. (See also Statement No. 3.)

Name of Work.		Amount.
Public Buildings.		$ c.
Parliament Buildings—Construction Account		6,285 75
Asylum for Insane, Toronto		7,587 65
do Mimico		5,946 05
do London		16,237 34
do Hamilton		5,629 00
do Kingston		4,874 46
do Brockville		3,905 01
do Cobourg		5,562 29
do Penetanguishene		6,683 99
do Woodstock		22,070 43
do Idiots, Orillia		3,194 18
Central Prison, Toronto		10,170 09
Reformatory for Females, Toronto		4,712 24
Institution for the Deaf and Dumb, Belleville		3,693 99
do Blind, Brantford		1,713 48
Educational Department and Normal and Model Schools, Toronto		3,449 73
Normal and Model Schools, Ottawa		2,473 67
School of Practical Science, New Bldgs	64,921 11	
do do (Equipment)	28,587 22	
		93,508 33
Agricultural College, Guelph		17,123 17
Eastern Dairy School, Kingston		2,690 48
Muskoka District.		
Lock-up, etc., Bracebridge		8 30
Parry Sound District.		
Court-House, etc., Parry Sound	464 75	
do Burk's Falls	16 50	
Lock-up, South River	500 00	
		981 25
Nipissing District.		
Lock-up, Court House, etc., North Bay	2,335 31	
do Sturgeon Falls	535 94	
do Sudbury	435 00	
		3,306 31
Algoma District.		
Court House, Gaol, etc., Sault Ste. Marie	584 01	
Lock-up, Nairn	300 00	
do Chapleau	18 75	
do Manitowaning	66 75	
	969 51	
Cr. Refund, Lock-up, Chapleau	18 75	
		950 76
Thunder Bay District.		
Court House, etc., Port Arthur	1,088 85	
do Fort William	442 50	
do Nepigon	60 00	
		1,591 35

STATEMENT No. 2—*Concluded.*

Name of Work.		Amount.
Rainy River District.		$ c.
Lock-up, etc., Rat Portage	407 10	
do Fort Francis	200 00	
do Dryden	21 00	
		628 10
Public Works.		
Removing rock obstructions, Bar River, Township of Macdonald		130 55
do North River, Township of North River		249 92
Veuve River Bridge, Township of Dunnett		918 70
Bridge over Wright's Creek, Township of Casey		753 40
Re-flooring Bridge, Pinewood—Rainy River District		375 00
Bridge at Calabogie, Township of Bagot		1,000 00
Berriedale Bridge, Township of Armour		935 77
Severn Bridge in Morrison, bal. of half cost, Simcoe county to pay remainder		850 00
Bridge over West Arm, Lake Nipissing		1,252 65
Hoodstown Road Bridge, Township of Chaffey		1,200 00
Maple Island Bridge, Magnetawan River, Township of McKenzie		993 32
Bridge at Rainy River balance 1904		6 25
Indian Point Bridge—Manitoulin Island		1,339 96
Drainage Works.		
Silver Creek and Castor River Works		2,400 00
Snake River Works		2,700 00
Long Swamp Works (on Davidson Creek)		1,500 00
Petite Castor and Annabel Works		2,700 00
Pottawatamie Works		500 00
McGregor Creek Works, Township of Howard		2,000 00
To complete bridge, at outlet Lake of Woods, to pay balance of costs		1,506 80
Bracebridge bridge (conditional)		7,000 00
Sturgeon River Bridge, Township Gibbons		2,342 60
Mary's and Fairy Lakes Works, to renew cribbing above and below lock		1,520 64
To renew high bridge above lock over Muskoka River		1,090 80
Peninsula Canal, renewing cribbing		2,302 64
Mattawa Bridge		6,986 63
Surveys, Inspections, Arbitrations and Awards, etc		546 67
Maintenance Locks, Dams and Bridges		8,975 36
Bridge over Portage Bay, Keewatin Bridge		4,809 50
Martland Township Bridge		201 50
Bridge at Baysville, Township of McLean and Ridout		900 00
Removing obstructions, Maskanonge Creek, Township of Cassimer		499 92
South River Bridge, Township of Machar		622 71
McCarthy Creek Bridge, Township of Gibbons		300 00
Blind River Bridge		61 97
Powassan Bridge		300 00
Payne River Bridge, Township of Finch		2,500 00
Colonization and Mining Roads		178,313 02
Aid to Railways (Cash expended)		120,860 68
Total		598,424 39

J. P. EDWARDS,
Accountant.

Department of Public Works, Ontario,
Toronto, February, 1906.

STATEMENT NO. 3.

Being a statement on Capital Account for Public Buildings, Public Works, Colonization and Mining Roads, Aid to Railways, etc., as follows: (1) The total of expenditure for four years and six months, from the 1st of July, 1867, to the 31st of December, 1871; (2) The total of expenditure for thirty-three years from the 1st of January, 1872, to the 31st of December, 1904; (3) The total of expenditure for the year 1905, and (4) The grand total of expenditure from the 1st of July, 1867, to the 31st of December, 1905.

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st of Dec., 1904.	Expenditure 1905.	Total expenditure to 31st Dec., 1905.
	$ c.	$ c.	$ c.	$ c.
BUILDINGS:—				
Government House	105,337 77	78,523 09	....	183,860 86
Old Parliament and Departmental Buildings	52,330 78	32,955 20	....	85,285 98
New Parliament and Departmental Buildings (Construction Account)	....	1,276,393 29	6,285 75	1,282,679 04
New Parliament and Departmental Buildings (equipment, grounds, roads, plant house, etc.)	....	230,934 62	....	230,934 62
Asylum for Insane, Toronto	173,014 71	216,312 76	7,587 65	396,915 12
do Mimico	....	628,870 63	5,946 05	634,816 68
do London	311,002 82	721,747 83	16,237 34	1,048,987 99
do Hamilton	....	931,010 60	5,629 00	936,639 60
do Kingston	....	491,719 10	4,874 46	499,593 56
do Kingston (Branch)	....	9,422 82	....	9,422 82
do Brockville	....	497,989 60	3,905 01	501,894 61
do Cobourg	....	120,941 95	5,562 29	126,504 24
do Penetanguishene	....	40,725 14	6,683 99	47,409 13
do Epileptics, Woodstock	....	58,471 97	22,070 43	80,542 40
do Idiots, Orillia	....	570,450 55	3,194 18	573,644 73
Central Prison, Toronto	10,925 96	900,191 98	10,170 09	921,288 03
Andrew Mercer Reformatory for Females, Toronto	....	254,253 08	4,712 24	258,965 32
Reformatory for Boys, Penetanguishene	12,080 74	179,431 26	....	191,512 00
Institution for Deaf and Dumb, Belleville	90,215 11	249,854 85	3,693 99	343,763 95
Institution for Blind, Brantford	69,318 75	217,542 82	1,713 48	288,575 05
Education Department and Normal and Model Schools, Toronto	13,613 50	213,090 57	3,449 73	230,153 80
Normal and Model Schools, Ottawa	....	228,698 61	2,473 67	231,172 28
Normal School, London	....	100,798 23	....	100,798 23
Normal College, Hamilton (equipment Domestic Science room)	....	854 25	....	854 25
School of Practical Science (College of Technology)	38,509 31	20,590 92	....	59,100 26
School of Practical Science, Queen's Park	....	252,535 56	....	252,535 56
School of Practical Science, New Chemistry and Mining and Milling Building	....	284,624 82	93,508 33	378,133 15
Agricultural College, Guelph	....	620,493 33	17,123 17	637,616 50
Dairy School Strathroy	....	14,583 71	....	14,583 71
do Kingston	....	17,031 70	2,690 48	19,722 18
Children's Shelter, Toronto	....	7,012 35	....	7,012 35
School of Mining, Kingston	....	4,070 00	....	4,070 00
Osgoode Hall, Toronto	....	148,062 85	....	148,062 85
Agricultural Hall	....	324 00	....	324 00
Government Farm, Mimico	47,350 00	4,296 34	....	51,646 34
Pioneer Dairy Farm, Algoma	....	5,178 43	....	5,178 43
Brock's Monument, Queenston Heights	....	4,605 31	....	4,605 31
Niagara River Fence	....	8,025 43	....	8,025 43

STATEMENT No. 3.—*Continued.*

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st Dec., 1904.	Expenditure 1905.	Total expenditure to 31st Dec., 1905.
	$ c.	$ c.	$ c.	$ c.
ALGOMA DISTRICT:				
Court House, Gaol and Registry Office, etc., Sault Ste. Marie........	2,469 52	27,562 62	581 01	30,616 15
Grand Manitoulin Island, three Lockups, Gore Bay, Little Current and Manitowaning..............	....	22,220 85	....	22,220 85
Lockup Killarney...............	....	1,292 97	....	1,292 97
do Bruce Mines.............	....	3,117 48	....	3,117 48
do Webbwood.............	....	1,634 24	....	1,634 24
do Thessalon.............	....	2,221 99	....	2,211 99
do Massie.............	....	702 74	....	702 74
do Blind River.............	....	1,042 87	....	1,042 87
do Chapleau.............	....	1,126 49	....	1,126 49
do Wawa.............	....	1,330 16	....	1,330 16
do Cutler.............	....	864 70	....	864 70
do Chelmsford.............	....	511 90	....	511 90
do Nairn.............	....	....	300 00	300 00
THUNDER BAY DISTRICT:				
Registry Office and Lockup, addition to Court House, etc., Port Arthur.	1,994 85	39,581 41	1,088 85	42,665 11
Lockup at Fort William...........	....	9,281 40	442 50	9,723 90
do Silver Islet, Lake Superior	....	2,304 79	....	2,304 79
do Nepigon.............	....	1,169 23	60 00	1,229 23
MUSKOKA DISTRICT:				
Immigration sheds at Gravenhurst..	....	355 00	....	355 00
Registry Office and Lockup at Bracebridge..........	....	30,201 81	8 30	30,210 11
Lockup and Court Room at Huntsville..........	....	8,364 85	....	8,364 85
Lockup and Court Room at Bayside	....	300 00	....	300 00
PARRY SOUND DISTRICT:				
Registry Office, Lockup and Court Room, etc., Parry Sound	1,715 20	24,901 27	464 75	27,084 22
Lockup at Magnetawan...........	....	615 56	..	645 56
do and Court Room at Burk's Falls..........	....	6,432 83	16 50	6,449 33
Lockup at French River.......	....	1,194 12	....	1,194 12
do Dunchurch..........	....	609 00	....	609 00
do Emsdale..........	....	300 00	....	300 00
do Byng Inlet	....	1,232 35	.....	1,232 35
do South River ...	....	....	500 00	500 00
NIPISSING DISTRICT:				
Lockup at Mattawa..............	....	14,771 75	....	14,771 75
do Court House and Registry North Bay	....	30,575 52	2,335 31	32,910 83
do Sudbury	....	12,160 48	435 00	12,595 48
do Sturgeon Falls......	....	1,730 34	535 94	2,266 28
do New Liskeard	....	657 00	....	657 00
do Warren	....	600 00	....	600 00
do Bonfield......	....	694 67	....	694 67
RAINY RIVER DISTRICT:				
Lockup, Court Room and Gaoler's Residence, new Registry Office, etc., Rat Portage (Kenora)......	...	35,939 93	407 10	36,347 03
Lockup at Fort Francis........	....	5,917 36	200 00	6,117 36

STATEMENT No. 3.—*Continued.*

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st Dec., 1904.	Expenditure 1905.	Total expenditure to 31st Dec., 1905.
RAINY RIVER DISTRICT:—*Continued.*	$ c.	$ c.	$ c.	$ c.
Lockup at Mines Centre		783 78		783 78
do Emo		1,888 94		1,888 94
do Atikokan		1,566 31		1,566 31
do Beaver Mills		1,840 71		1,840 71
do Dryden		500 00	21 00	521 00
COUNTY OF HALIBURTON				
Registry Office at Minden		5,918 42		5,918 42
WORKS:—				
Young's Point lock	30,035 07	1,157 65		31,192 72
Balsam and Cameron Lakes locks	15,715 20	8,243 82		23,959 02
Mary's and Fairy Lakes lock works and bridge over Muskoka River at Huntsville		79,844 12		79,844 12
Mary's and Fairy Lakes lock works to renew High bridge above lock over Muskoka River			1,090 80	1,090 80
Mary's and Fairy Lakes lock works to renew cribbing above and below lock			1,520 64	1,520 64
Magnetawan works, lock, swing bridge, dam and river improvements; dam and slide, Deer Lake, swing bridge, Township of Ryerson; dredging, Burk's Falls, and removing obstructions Ah Mic Lake		74,461 10		74,461 10
High Falls, Pigeon River; slide, Dam, etc., (C. L. D.)		9,706 07		9,706 07
Georgian Bay works		7,149 97		7,149 97
Landing pier at Port Elgin		2,750 00		2,750 00
Landing pier at Southampton		2,022 63		2,022 63
Docks at Southampton, Saugeen River		1,814 04		1,814 04
Docks on the Rainy River		3,088 44		3,088 44
Docks (landing) at Beaudrault's, Wabigoon		777 95		777 95
Muskoka Lakes works		21,915 30		21,915 30
Muskoka Lakes works, lock, bridges and dredging at Port Carling	34,542 54	25,655 67		60,198 21
Muskoka Lakes works, cut and bridge at Port Sandfield	9,761 80	7,081 06		16,842 86
Muskoka Lakes works, Muskoka Falls, works and bridges at Bala		8,579 37		8,579 37
Muskoka Lakes works, Joseph River works (less contribution)		486 87		486 87
Nipissing Lake works		9,182 17		9,182 17
Couchiching Lake works		427 82		427 82
Mud Lake works (Township of Dalton		1,502 32		1,502 32
Kushig Lake dam		300 00		300 00
Mississicua Lake dam		4,989 84		4,989 84
Star Lake works		412 22		412 22
Manitou Lake works, dam at outlet, etc., Rainy River District		2,794 14		2,794 14
Inkerman Dam, removal of (County Dundas		1,000 00		1,000 00
Bottle Lake Dam and Mississicua Creek Dam		4,068 72		4,068 72
Shoal Lake and Lake of the Woods improvements, Ash Rapids		5,998 25		5,908 25

STATEMENT No. 3.—*Continued.*

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st Dec., 1904.	Expenditure 1905.	Total expenditure to 31st Dec., 1905.
	$ c.	$ c.	$ c.	$ c.
Mill Creek improvements (County of Prescott)		1,000 00		1,000 00
Lake of Bays, dredging mouth of river at outlet of		581 82		581 82
Peninsula Creek Improvements, bridges, cribbing, etc		34,993 02	2,302 64	36,795 66
Stoney Creek Works (Township of Ops)		4,828 25		4,828 25
Union Creek Improvements		1,050 63		1,050 63
Bear Creek Works—dam and slide		1,617 52		1,617 51
Lake Scugog Works—dredging at Port Perry		977 53		977 53
Lake Scugog flats road		1,500 00		1,500 00
Cobb's Lake Outlet		1,102 08		1,102 08
Gull and Burnt River Works—dams, slides and bridges, etc		100,716 60		100,716 60
Muskoka River Works		42,670 53		42,670 53
do do bridge at South Falls		1,000 00		1,000 00
do do do Port Sydney		1,000 00		1,000 00
Sydenham River Works	374 76	1,781 50		2,156 26
Nottawasaga Works	1,708 82	4,206 27		5,915 09
Kaministiquia River Works	197 10	22,667 92		22,865 02
Scugog River Works (including Lindsay Lock and swing bridges)	27,760 34	70,137 04		97,897 38
Pigeon River Works (Co. of Victoria)	1,527 40	3,472 22		4,999 62
Otonabee River Works		9,162 91		9,162 91
Balsam River Works		16,585 11		16,585 11
Wye River Works		5,176 98		5,176 98
Squaw River Works		1,688 16		1,688 16
Moose River Works (Co. of Stormont)		1,000 00		1,000 00
Black River Works (Lake Simcoe)		3,136 10		3,138 10
Jean Baptiste River, construction of bridge over (Tp. of Beauchamp)		2,850 00		2,850 00
Mattawa River Works, and bridge		500 00	6,986 63	7,486 63
Wabis River Works (Tps. Dymond, Harris and Kearns)		1,340 51		1,340 51
Wabis River bridges		2,773 33		2,773 33
Wabis Creek, to construct bridge over		1,760 08		1,760 08
Squaw River Works, dam at Harvey		581 56		581 56
Indian River Works, deepening—Tps. Sarawak and Keppell		1,850 82		1,850 82
Whitefish River—removing obstructions		249 15		249 15
North River—removing obstructions		659 14	249 92	909 06
Bar River—Township of McDonald—removing obstructions			130 55	130 55
Cassimer Creek-removing obstructions		205 56		205 56
McKenzie Creek, improvements		200 35		200 35
Snake River improvements		140 65		140 65
Madawaska River—swing bridge at Combermere, bridge Burnstown and bridge Township of Raglan		12,171 43		12,171 43
ation River Works—Bridge, etc		15,877 23		15,877 23
Nation River, contribution		4,000 00		4,000 00
Petawawa River bridge		3,879 25		3,879 25
Sturgeon River bridge (Township of Field)		3,616 08		3,616 08
To construct steel bridge at outlet Lake of the Woods, at Rat Portage (Kenora)		24,949 02	1,506 80	26,455 82

STATEMENT No. 3.—*Continued.*

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st Dec., 1904.	Expenditure 1905.	Total expenditure to 31st Dec., 1905.
	$ c.	$ c.	$ c.	$ c.
Rainy River road bridges		4,429 84		4,429 84
Stanley bridge—Thunder Bay District.		8,136 09		8,136 09
Blind River bridge		2,710 37	61 97	2,772 34
Buck Lake bridge, to rebuild		305 06		305 06
Black River bridge to rebuild (Township of Draper,) Muskoka		509 48		509 48
To rebuild bridges in Frontenac, destroyed by fires: Clyde River, Mud Lake and Concession 1st, Clarendon		3,288 06		3,288 06
Kinmount bridge		1,500 00		1,500 00
Bridge over Jean Baptiste, (Township of Armstrong)		98 31		98 31
Bridge on Round Lake road		19 00		19 00
Baysville bridge		2,047 50		2,047 50
Calabogie bridge, Township of Bagot		800 00	1,000 00	1,800 00
Echo River bridge		1,332 11		1,332 11
Wasdale bridge (Ontario and Simcoe)		1,000 00		1,000 00
Wahnapitae River bridge, and approaches		4,642 49		4,642 49
Delta Creek improvements		99 24		99 24
Bridge over west arm Lake Nipissing		3,651 34	1,252 65	4,923 99
Bridge over Sunday Creek		603 00		603 00
Bridge over La Blanche River		2,929 87		2,929 87
Severn bridge, Township of Morrison		2,500 00	850 00	3,350 00
Seguin River bridge		3,754 00		3,754 00
Bridge on Wawa road		1,198 39		1,198 39
Black bridge (Muskoka), construction of		1,500 00		1,500 00
Gannon's Narrow's bridge (contribution)		1,000 00		1,000 00
Chemong Lake bridge		3,500 00		3,500 00
Veuve River bridge, Township of Dunnette			918 70	918 70
Bridge over Wright's Creek, Township of Casey			753 40	753 40
Reflooring bridge at Pine Wood—Rainy River District			375 00	375 00
Bracebridge bridge (conditional)			7,000 00	7,000 00
Sturgeon River bridge, Township of Gibbons			2,342 60	2,342 60
Bridge over Portage Bay, Keewatin bridge			4,809 50	4,809 50
Martland Township bridge			201 50	201 50
Bridge at Baysville, Townships McLean and Ridout			900 00	900 00
Maskanonge Creek, Township of Cassimer, removing obstructions			499 92	499 92
South River bridge, Township of Machar			622 74	622 74
McCarthy Creek bridge, Township of Gibbons			300 00	300 00
Towassan bridge			300 00	300 00
Payne River bridge, Township of Finch			2,500 00	2,500 00
Berriedale Bridge, Tp. of Armour			935 77	935 77
Hoodstown Road Bridge, Township of Chaffey			1,200 00	1,200 00
Maple Island Bridge, Magnetawan River, Township of McKenzie			993 32	993 32

STATEMENT No. 3.—*Continued.*

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st Dec., 1904.	Expenditure 1905.	Total expenditure to 31st Dec., 1905.
	$ c.	$ c.	$ c.	$ c.
Bridge at Rainy River, balance 1904, Col'n			6 25	6 25
Indian Point Bridge, Manitoulin Island			1,339 96	1,339 96
Beaudette River (to aid in dredging, etc)		3,000 00		3,000 00
Mississippi River improvements (below Carleton Place.)		4,730 71		4,730 71
Head River improvements (Townships Laxton and Cardon)		976 82		976 82
Moira River improvements (Township of Thurlow		2,135 32		2,135 32
Muskrat River improvements		1,861 98		1,861 98
Payne River works		4,000 00		4,000 00
Otonabee River Bridge		2,500 00		2,500 00
Trent River works		2 000 00		2,000 00
Bridge, Township of Cambridge		1,000 00		1,000 00
Indian Point bridge (Manitou Island)		2,596 61		2,596 61
Mississicua River bridge, repairs		4,355 94		4,355 94
Stoney Creek bridge, Ryerson		831 68		831 68
Damage by raising waters, near Rat Portage (Kenora.)		800 00		800 00
Washago and Gravenhurst Road	25,188 69	7,603 43		32,792 12
Washago Wharf		489 22		489 22
Portage du Fort bridge, Ottawa River		10,747 99		10,747 99
Des Joachims Rapids, bridge and approaches		9,937 72		9,937 72
Surveys, inspections, arbitrations and awards, etc	1,137 34	52,139 98	546 67	53,823 99
Deer Lake works, dam and slide (Township of Anstruther)		1,420 17		1,420 17
Nogies Creek works		2,144 57		2,144 57
Cashmere Dam (obstructions) Middlesex		1,141 19		1,144 19
Eagle Lake works, to construct dam at outlet		1,173 84		1,173 84
Bass Lake dam, Townships Galway, Peterborough		1,000 00		1,000 00
To remove obstructions from navigable streams		513 02		513 02
Bonnechere River works		338 50		338 50
Talbot River works		605 95		605 95
Repairs and maintenance locks, dams, slides, bridges, etc		194,188 26	8,975 36	203,163 62
DRAINAGE WORKS:				
Tilbury east outlet drain		3,020 00		3,020 00
Beaver Creek drain, Cornwall Township		750 00		750 00
Pelee Island drainage, 63 Victoria, Chap. VIII		1,500 00		1,500 00
Miscellaneous drainage		27 00		27 00
Drainage works (Tp. of Elma)		4,000 00		4,000 00
Big Creek drain (Tps. West and North Tilbury)		8,367 30		8,367 30
Outlet drain, Eastnor Tp.		2,480 00		2,480 00
Petite Castor River and Annabel Creek drainage works (Tp. Winchester)		5,000 00	2,700 00	7,700 00

STATEMENT No. 3.—*Continued.*

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st Dec., 1904.	Expenditure 1905	Total expenditure to 31st Dec., 1905.
	$ c.	$ c.	$ c.	$ c.
DRAINAGE WORKS:—*Continued.*				
Becquithe Creek drain (Cumberland and Clarence Tps.)		1,000 00		1,000 00
Kenyon, Charlottenburg Cornwall and Roxborough Tps.)		700 00		700 00
Moncklands drainage scheme, Roxborough Tp.		1,200 00		1,200 00
Nesbit and Rogers drains (Tp. Bosanquet)		300 00		300 00
Mud Lake drainage (Tp. Keppel)		963 23		963 23
Fraser Creek drainage (Tp. Roxborough)		300 00		300 00
Outlet for Durham Creek (Tp. Brooke)		1,300 00		1,300 00
North Branch drainage works (Tps. Roxborough and Cornwall).		2,000 00		2,000 00
Pottawatomie River drainage works (Tp. Derby)		3,000 00	500 00	3,500 00
Douro drainage works (Tp. Douro).		1,200 00		1,200 00
Ruscomb drainage works (Tp Rochester)		3,000 00		3,000 00
Forbes drainage works (Tp. East Tilbury)		2,000 00		2,000 00
Pelee Point drainage works (Tp. Mersea)		2,000 00		2,000 00
Snake River (Tp. Bromley)		5,000 00	2,700 00	7,700 00
Lalonde Drainage Works		900 00		900 00
Silver Creek and Castor River works, Townships Mountain, Osgoode, South Gower and Winchester			2,400 00	2,400 00
Long Swamp drainage works (or Davidson) Township of Keppel			1,500 00	1,500 00
McGregor Creek works, Township of Howard			2,000 00	2,000 00
Surveys and drainage swamp lands (Prov. acct.)	25,489 17	11,111 34		36,600 51
Aldborough drainage works.		7,199 02		
Brooks "	15,218 95	19,528 78		
Delaware "		5,740 93		
Dunwich "	6,339 30	3,766 56		
Ekfrid, Caradoc and Metcalf drainage works	11,308 75	2,358 91		
Grey drainage works	6,127 55	2,047 92		
Moore "	194 80	16,896 78		
Mosa "	9,005 41	3,709 34		329,980 93
Nissouri West "		8,178 50		
Raleigh "	25,191 15	12,818 49		
Russell "		11,543 77		
Sarnia "		40,540 55		
Sombra "		53,169 04		
Tilbury East "	17,757 50	17,540 12		
Tilbury West "		31,577 06		
Williams, East "		2,221 75		
Temiskaming Railway surveys		24,823 58		24,823 58
Roads, Township Ryerson	1,409 04	5,886 02		7,295 06
Clearing and log houses on free grant lands (Settlers' Homestead Fund)	3,682 03	13,098 72		16,780 75
Colonization and Mining roads	189,595 91	3,869,868 53	178,508 02	4 237,972 46

STATEMENT No. 3.—*Concluded.*

Name of Work.	Expenditure 1st of July, 1867, to 31st Dec., 1871.	Expenditure 1st Jan., 1872, to 31st Dec., 1904.	Expenditure 1905.	Total expenditure to 31st Dec., 1905.
	$ c.	$ c.	$ c.	$ c.
Aid to railways	...	7,456,173 01	120,860 68	7,577,033 69
Note.—				
Certificates issued to railways... ...... $ 9,785,818 05				
Cash paid direct to railways 1,784,862 42				
Aid granted 2,441 $\frac{337}{1000}$ miles............. 11,570,680 47				
Certificates outstanding...... ..... 3,993,646 78				
Actual cash expended to 31st of December, 1905 .... $ 7,577,033 69				
Totals	1,389,147 67	22,682,332 58	598,424 39	24,669,904 64

Department of Public Works, Ontario,
Toronto, February, 1906.

J. P. EDWARDS,
Accountant, *Pro.*

STATEMENT No. 4.

Being classified statement showing the Expenditure on Capital Account for Public Buildings, Public Works, Roads, Railways, etc. : (1) The total expenditure for four years and six months, from the 1st of July, 1867, to the 31st December, 1871 ; (2) The total expenditure for thirty-four years, from the 1st of January, 1872, to the 31st December, 1905, and (3) The grand total expenditure from the 1st of July, 1867, to the 31st December, 1905.

Name of work	Expenditure 1st July, 1867, to 31st December, 1871.	Expenditure 1st July, 1872, to 31st December, 1905.	Total expenditure to 31st December, 1905.
	$ c.	$ c.	$ c.
1. Asylums for the Insane, etc., at Toronto, Mimico, London, Hamilton, Kingston, Brockville, Orillia, Cobourg, Penetanguishene and Woodstock	484,017 53	4,372,257 35	4,856,274 88
2. Penal institutions viz., Reformatory for Females, Reformatory for Boys and Central Prison	23,006 70	1,348,854 65	1,371,861 35
3. Educational institutions, viz., Institutions for Deaf and Dumb, Institution for Blind, School of Practical Science, Normal and Model Schools, Toronto, Ottawa and London	211,656 70	1,684,512 18	1,896,168 88
4. Agricultural Institutions, viz.: Agricultural College, Guelph ; Dairy Schools, Kingston and Strathroy ; Dairy Farms, Mimico and Algoma	47,350 00	681,721 16	729,071 16
5. Buildings for Administration of Justice, being Osgoode Hall and Court Houses, Lock-ups, etc., in the Districts of Algoma, Thunder Bay, Muskoka, Parry Sound, Nipissing, and Rainy River	6,179 57	461,224 76	467,404 33
6. Parliament and Departmental Buildings, and Government House	157,668 55	1,625,091 95	1,782,760 50
7. Works for the improvement of Navigation, such as locks, dams, slides, etc	122,760 37	897,255 16	1,020,015 53
8. Works for the Improvement of Transportation, such as bridges, piers, roads, etc.	26,597 73	220,387 21	246,984 94
9. Drainage Works Expenditures and Advances to Municipalities	116,632 58	313,329 27	429,961 85
10. Miscellaneous Expenditure, viz., Brock's Monument, Niagara River Fence, Clearing of Log Houses, Township of Ryerson and Temiskaming surveys	3,682 03	50,908 04	54,590 07
11. Colonization and Mining Roads	189,595 91	4,048,181 55	4,237,777 46
12. Aid to Railways (actual cash expended)	....	7,577,033 69	7,577,033 69
Grand total	1,389,147 67	23,280,756 97	24,669,904 64

J. P. EDWARDS,
Accountant.

Department of Public Works, Ontario,
Toronto, February, 1906.

STATEMENT No. 5.

Statement of Contracts and Bonds, etc., entered into with His Majesty in 1905.

Date	Service	Subject of Contract	Contractor.	Sureties.	Description of Contract.	Amount.
Feb. 13	Bridge over Wright's Creek, Casey Township	Erection of Bridge	William Judge of the Town of New Liskeard.	None		$612,00
Mar. 22	School of Practical Science, Toronto.	Equipment in connection with the ventilating and heating system in the new Chemistry and Mining Building.	Purdy, Mansell Company of the City of Toronto.	Daniel Glynn and Francis M. Purdy, both of the City of Toronto.		2,880 00
March 22	Asylum for Epileptics, Woodstock.	Ventilating apparatus to be installed in two cottages.	Purdy, Mansell Company of the City of Toronto.	Daniel Glynn and Francis M. Purdy, both of the City of Toronto.		2,242 00
June 21	Departmental Buildings and Institutions, Toronto.	Government House, Educational Dept., School of Science and Osgoode Hall, supply of pine slabs for season of 1905 6.	The J. H. Hammill Company, Limited, of the City of Toronto.	S. Frank Wilson and C. A. Wilson, both of the City of Toronto.	Pine slabs per cord	4 00
June 21	Departmental Buildings and Institutions, Toronto.	Supply of soft coal, hard wood and pine wood for Government House, Educational Buildings, School of Science and Osgoode Hall, season 1905 6.	The Imperial Coal Company of the City of Toronto.	J. P. Richelieu and Frank M. C. Dickson, both of the City of Toronto.	Soft coal per ton Hardwood per cord Pine wood per cord	4 25 7 00 5 00
June 21	Departmental Building, and Institutions, Toronto.	Supply of hard coal and soft coal screenings for Government House, Parliament Buildings, Educational Buildings, School of Science and Osgoode Hall, Toronto.	William McGill & Company of the City of Toronto.	George N. Williams and Edward Reeves, both of the City of Toronto.	Grate coal per ton Egg, Stove and nut per ton Pea coal per ton Soft coal screenings	5 80 6 00 4 20 2 96

STATEMENT No. 5.—*Continued.*

Statement of Contracts and Bonds, etc., entered into with His Majesty in 1905.—*Continued.*

Date.	Service.	Subject of contract.	Contractor.	Sureties.	Description of contract.	Amount.
June 21	Normal School, London	Supply of hard coal and pine slabs for the season of 1905-6.	William Buchanan of the City of London.	John D. Wilson and Adam T. McMahon, both of the City of London.	Small egg hard coal per ton Pine slabs per cord	6 35 4 00
June 21	Normal and Model School, Ottawa.	Supply of hard coal for the season of 1905-6.	The C. C. Ray Company, Limited, of the City of Ottawa.	Charles E. Russell and George P. Murphy, both of the City of Ottawa.	Small egg hard coal per ton	6 25
June 27	Normal School, Ottawa.	Supply of hard wood and pine slabs for the season 1905-6.	John Heney & Son of the City of Ottawa.	John Black and Theo. W. Germain of the City of Ottawa.	Hardwood per cord Pine slabs per cord	5 90 2 85
June 21	Institution for the Deaf and Dumb, Belleville	Supply of hard coal for the season 1905-6.	Nathaniel Allen of the City of Belleville.	John McKeown and Thos. Stewart, both of the City of Belleville.	Large egg coal per ton Stove coal per ton	5 70 6 00
June 21	Institution for the Deaf and Dumb, Belleville	Supply of hard coal for the season 1905-6.	George Plunkett of the City of Belleville	P. J. Carey and D. Rooney, both of the City of Belleville.	Small egg and Nut coal per ton	6 00
June 27	Institution for the Blind, Brantford.	Supply of hard and soft coal for the season 1905-6.	The Brantford Coal Company, Limited, of the City of Brantford	James S. Millan and D. S. Gibson, both of the City of Brantford	Hard coal per ton Soft coal per ton	5 68 4 18
July 15	School of Practical Science.	Carpenters work in connection with the erection of an Observatory.	Richard Dinnis & Son, Limited, of the City of Toronto.	None		769 00

July 19	Central Prison, Toronto	Installation of electric light apparatus complete.	The Canadian General Electric Company, Limited, of the City of Toronto.	None		2,825 00
July 28	Mimico Asylum	Complete installation of stokers —equipment.	The Underfeed Stoker Company, Limited.	None		1,900 00
July 28	Cobourg Asylum	Complete installation of stokers —equipment.	The Underfeed Stoker Company, Limited.	None		2,850 00
July 28	Central Prison, Toronto	Complete installation of stokers —equipment	The Underfeed Stoker Company, Limited.	None		3,800 00
August 14	School of Practical Science, Toronto.	Additional equipment in New Chemistry & Mining Building.	Augustine Foy of the City of Toronto.	None		1,261 00
August 19	Parliament Buildings, Toronto.	Lathing and plastering, etc., for additional rooms on the upper flat.	William J. Hynes of the City of Toronto.	None		$791 00
August 22	Osgoode Hall, Toronto.	Installation of additional mains for fire protection.	Purdy, Mansell & Company of the City of Toronto.	None		715 00
August 23	School of Practical Science, Toronto.	Plumbing work for the additional equipment of the Chemistry & Mining Building	Fiddes and Hogarth	None		825 00
August 23	Thunder Bay District.	Plumbing and drainage work at the Court House and Jail Buildings at Port Arthur.	J. Marshall & Company of the Town of Port Arthur.	None		965 00
August 24	Nipissing District	Alterations to Gaol, North Bay.	R. Wallace & Son of the Town of North Bay.	None		1,100 00
August 24	Nipissing District	Erection of a gaoler's residence at North Bay.	R. Wallace & Son of the Town of North Bay.	None		2,800 00

STATEMENT No. 5.—*Concluded.*

Statement of Contracts and Bonds, etc., entered into with His Majesty in 1905.—*Concluded.*

Date.	Service.	Subject of contract.	Contractor.	Sureties.	Description of contract.	Amount.
September 15	Agricultural College, Guelph.	Erection of a pair of brick Cottages.	Shadrach F. Witham of the City of Brantford	David Hall and James Christie, both of the City of Brantford.	.....	2,800 00
September 15 ...	Agricultural College, Guelph.	Erection of a building for Farm Mechanics.	Shadrach F. Witham of the City of Brantford	David Hall and James Christie, both of the City of Brantford.	....	28,470 00
September 16...	Asylum for the Insane, London.	Erection of a coal house in connection with the Infirmary Building.	Jones Brothers of the City of London.	None....	....	887 00
September 23..	Rainy River District.	Bridge across Portage Bay in the Village of Keewatin.	Frederick Gilbert of the Municipality of Keewatin.	Samuel Hunter and J. N. Ladouceur, both of the Municipality of Keewatin.	....	4,775 00
October 30......	Asylum for Epileptics, Woodstock.	Supply of water pipe....	Gartshore-Thomson Pipe Foundry Company, Limited, of the City of Hamilton.	None	....	4,525 00
November 7....	Agricultural College, Guelph.	Supply of air compressor, plunger pump and steel tank.	The Canada Foundry Company, Limited, of the City of Toronto.	None....	....	1,936 00

Department of Public Works, Ontario,
Toronto, February, 1906.

J. P. EDWARDS,
Law Clerk.

Eighteenth Annual Reports

OF THE

Inspectors of Factories

FOR THE

Province of Ontario

1905

Published by the Ontario Department of Agriculture, Toronto

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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1906

WARWICK BRO'S & RUTTER, LIMITED, PRINTERS.
TORONTO.

To the Honourable WILLIAM MORTIMER CLARK, K.

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I have the pleasure to present herewith for the consideration of your Honour, the Reports of the Inspectors of Factories for 1905.

Respectfully submitted,

NELSON MONTEITH,

Minister of Agriculture.

TORONTO, 1906.

REPORTS

OF THE

INSPECTORS OF FACTORIES

FOR THE

PROVINCE OF ONTARIO

1905.

REPORT OF INSPECTOR JAS. T. BURKE.

To the Honorable the Minister of Agriculture:

SIR,—I beg to submit the following report of work performed and suggestions that should apply towards improving factory conditions in the Province for the year ending December 31st, 1905.

This year will compare favorably with preceding years in so far as it relates to the industrial and commercial conditions of the Province. Building operations have been very extensive, embracing many new and handsome factory buildings and the remodelling of existing ones, which were much required, as owing to the desire of all interested to try and meet the expansion of trade, greater facilities were needed. In closing the year, I find that general business activity continues uninterrupted, and the stability of industrial and mercantile pursuits remain unchanged.

OVERTIME PERMITS.

Applications for overtime permits were about the same relatively as those of last year, but in all cases where permits were granted the reasons assigned were in accordance with the intention of the Act.

CHILD LABOR.

I have given this question a great amount of attention on my many visits through the different factories in my district. I may also add that I have received most valuable assistance from the regularly appointed truant officer, who is not burdened with so many positions that he can join with us in giving this matter the requisite attention. Unfortunately, the Truancy Act is not so well enforced in one or two cities in my district, and in a great many villages and towns we are met with this question: "Is it not better to have the child working and off the streets than running the streets getting, perhaps, into all kinds of mischief, because they will not attend school?" My instructions have always been that the law clearly states that boys and girls under fourteen years of age must not be employed in factories, and it is further our belief that where a child is put to labor and kept in confinement at an allotted task for ten or even

less hours a day, it is being done in violation of its natural rights; and therefore, beyond the mere fact that our restrictive child labor laws have tended to reduce competition in the labor market, they have been and always will be of vast direct benefit to the children themselves and the country at large.

Locking Doors During Working Hours.

Under this head we found that some factory doors were locked at all times during working hours except morning, noon and quitting time, and that the key was usually kept in the office, which in some cases was a long distance from the employees' entrance. This is a violation of Section 21, which I pointed out to those in charge, who stated that it was in their judgment necessary to keep doors locked during working hours in order to guard against insurance agents, book agents and others from entering their warerooms and taking up the time of their employees. While these reasons may be fairly good for locking the doors during working hours, yet in case of a fire or panic from any cause, consider the possibilities. After the first alarm to where do the women rush? To the door, of course. They find it locked. Men would attempt to beat it down. Women are helpless creatures of impulse. Some would beat at the door vainly with their hands; others would faint away. Some would rush for the windows, and if there were any real danger, might throw themselves head long into the street. Imagine the difference, if the door at which they rushed were unlocked. Out they would fly to the hallway and stairs and employes on other floors would rush to their aid. If it were a senseless panic it would be all the sooner quelled. If there were cause for it, more of the workers on that floor would be saved. I do not think it is the desire of any employer to keep his employees penned in like sheep, or is it that employers desire or court any injury to their employees by locking the doors; but instead, it is a pure lack of considering what might happen in the event of a fire or panic breaking out in their factory premises unexpectedly, and thus endangering the lives of their employees

Fire-escapes.

I have had several fire-escapes erected during the year. In some cases we encounter opposition from those responsible for seeing that exits are provided for their factory buildings It also requires eternal vigilance on the part of the inspectors to keep in touch with the movements of some tenants who are found on one visit operating on the second floor, and the upper floors used possibly for storage, or perhaps untenanted; but on the next visit, you will find them manufacturing on top floors with only one stairway exit and that badly arranged in some buildings, and with no outside fire-escape. Then, it is our duty to serve notice on the owner, who in some cases rather than erect a modern fire-escape serves notice on the tenant, if monthly, to move out. Again, we frequently find that approaches from each floor to balconies have been entirely blocked by some one of the employer's staff who should know better than to block exit passages which are meant at all times to be kept free and well lighted. History often repeats itself, and in cases of panic or sudden danger no individual can be trusted to take the obviously reasonable course to prevent accidents, or to get to a place of safety. Their escape must be ensured for them by the provision of unobstructed exits, which are as accessible as it is possible to make them

Roller Journal Bearings.

As a great many inquiries are made about roller bearings, I can only say that journal friction has received a great deal of attention from many quarters. At present, a great deal depends on the character of the surface of the journals, that is, its degree of smoothness, the kind of composition in the make-up of the

bearings, the kind of lubricant, whether grease or oil, the different temperatures under which they are operated, the accuracy of the shafting, etc., load on journals and the speed. These appear to be some of the most salient features to be reckoned with when the question of journal friction is being considered.

Noonday Meal.

Sub-section 2 of Section 9 of the Ontario Factories Act states that in every factory, the employer shall allow every child, young girl and woman therein employed, not less than one hour at noon of each day for meals, but such hour shall not be counted as part of the time herein limited as respects the employment of children, young girls and women. In view of the Act being so clear, there can be no possible chance of misunderstanding its meaning, yet we are occasionally in receipt of petitions requesting us to grant permission to allow the female employees one-half hour for the noonday meal. The reason advanced is that the noonday meal is partaken of on the premises in rooms provided for the purpose by the employers, and that thirty minutes is sufficient time in which to partake of their dinners, particularly where it is carried; and that they could then work the other half hour and quit work in the evening one-half an hour earlier, which would enable them to catch street cars before the congested hour, six o'clock, when the male employees quit work and till the street cars. Another reason is that they would get home or to their respective boarding-houses one-half an hour earlier and therefore enjoy a longer evening. I may say that our position is that of enforcing the Act, and in every case we have referred both the petitioners and the employers to the Act, which requires one hour for the noonday meal. Of course the applicants are entitled to some consideration, particularly where women bring their dinners and are the only help employed in a certain room or part of the factory. But on the other hand, we usually find both women and men employed in our factories, and one of the dangers in changing the present Act would be that employers do not favor a division of the noonday meal hour; and if the Act was changed to meet the wish of the women the men would undergo a certain hardship, as in their case they are not protected by the law, which provides that employers shall provide eating rooms only for the female employees, if so notified in writing by the Inspector. Again, they would have to accept one-half hour for the noonday meal, and in many cases where the men are conceded the full hour for dinner they are privileged to go home, when the distance is not too far away from their employment; yet we find in some cases where men carry their dinners that the employers have been considerate and furnish eating and dressing rooms, and in some cases baths are provided. I would be pleased to see other employers who are not included as having provided the above necessities fall in line, and follow this sound humanitarian example, which will in a short time more than repay them for the outlay. Again, I desire to offer a word of advice to the male employees who have such places provided by their employers for their comfort, that they should show their appreciation by joining hands with the employer in trying to maintain a system of cleanliness, and guard against injury to the bath, dressing or eating rooms.

Prosecutions.

On February 4th, Messrs. Burke Bros., bakers, of Hamilton, were prosecuted for a violation of section 39 of the Bake Shops Act. The Police Magistrate withheld his decision.

Fires from Spontaneous Combustion

I desire to draw the attention of manufacturers who for want of space and, perhaps, convenience, are in the habit of storing coal in the boiler-house up

against the brick-work alongside the boilers. Bituminous coal should not be stored where it will come in contact with wooden partitions, columns, or against warm boiler settings or steam pipes. This coal should not be very deep if it is to be kept in storage for a long period. If piled in a basement of the building, it should be shallow and free from moisture and under good ventilation, and that which is liable to absorb moisture should be burned first. If on fire a small quantity of water showered on this kind of coal, cokes it upon the top and retards any great supply of water reaching the fire, which necessitates the overhauling of the entire coal pile. Again, iron chips, filings, or turnings should not be stored in wooden boxes. The oily waste, which is not infrequently thrown among them, adds to the danger of fire from this source The sweepings from the machine shop, if kept on hand, should never be placed over iron shavings. This mass of disintegrated iron is enough to incite heat and combustion. Iron, steel filings and turnings when mixed with oil will ignite spontaneously after becoming damp. A steam pipe against wood will cause the latter to ignite spontaneously after being carbonized, particularly if superheated steam enters the pipe which increases the heat temperature.

Removal of Dust, etc.

The law requires employers to provide mechanical means for the removal of dust, etc., from all dust-creating machinery that is dangerous to the health of the employees in any factory. This law has and is being strictly enforced, yet occasions arise where the system, after being installed, does not for some reason or another work satisfactorily. On examination, the cause is sometimes attributed to the faulty construction. Again, often the employees do not use the system with the care and attention that it should receive. Finally, we are confronted, sometimes with secret information, that the employer desired something cheap and inexpensive to meet the requirements of the Act. Any one of those reasons are sufficient to reverse the spirit and intention of the law relating to the proper removal of dust, etc , by a mechanical method, which is and can be applied satisfactorily where the spirit is not only to comply with the law, but also to secure a modern system for removing the refuse so harmful in certain trade processes of manufacturing.

The following suggestions are useful when installing an exhaust fan system: The size of the fan depends, of course, upon the system to be served, that is, the size and number of machines in use. Then arrange the maximum diameter of the main exhaust pipe, which at the proper pressure will handle the air without excessive frictional losses. Avoid abrupt turns in your piping, and also avoid having two branches enter directly opposite each other. Never enter a branch of pipe at right angles to the main suction pipe, but make this connection with the angle favoring the suction, which aids in preventing interference with the draft. Also guard against branch pipe connections being made at the bottom of main suction pipes. Blast gates should also be used so that pipes leading to machines, when not being used can be closed, which ensures a saving of power, as the exhauster requires less power to drive it when branch pipes are closed than when they are open. The size and shape of hoods must be controlled entirely by the class of work to be done, but the hood should fit as close as possible to the wheel, etc. The system for woodworking establishments should be constructed on the same scientific principle as that for removing emery dust, etc., except that the system for wood refuse requires a sharp blast and an excess in the size of the pipes to allow for additional friction; but the essential features of all exhaust systems are identical.

WATER CLOSETS.

A very necessary adjunct to every mercantile and manufacturing establishment is that of providing a sufficient number of closets and urinals for the amount of help employed. In order to be of good service, care should be exercised in securing closets and urinals that are so mechanically constructed that they will not get out of order very easily Great care should be taken to guard against securing closets and urinals that have been condemned by both health and sanitary authorities, and we find that such closets do exist in some of the older factory buildings and are always troublesome With the object in view of securing closets and urinals of modern construction, I have undertaken to describe the workings, etc of some of those inside closets, which may be of benefit to those who intend installing closets and urinals in new factory buildings. The pan and plunger closets have been condemned by Health Boards and sanitary authorities and should be replaced by closets of modern construction. Hoppers or washdown closets are designated as short or long hoppers, according as their traps are above or below the floor. Long hoppers are only used where there is danger of the trap being frozen, in which case the traps are placed below frost level. Short hoppers are fitted with flushing tanks overhead. Long hoppers are usually fitted with a valve below frost level. Wash-out closets consist of a basin and trap both above the floor They differ from hopper closets in that the water in the basin is separate from that in the trap. They are generally used on good common work and are said to be thoroughly sanitary, but being somewhat noisy are not so desirable as siphon closets for dwellings. Siphon closets have their contents removed by siphonage through a long crooked outlet. The water in the basin being employed as a trap. They are almost noiseless in operation. There are many kinds of these closets on the market, but the most reliable is the simply siphon jet. Those having a low down tank are the most silent in action. Pneumatic siphon jet closets are too complicated to be reliable.

The dimensions of closets vary considerably. The following however, is good practice:

Width of bowl over all............13 inches.
Height from seat to floor...........17 inches.
Depth from wall to front of seat....23 inches.

The distance from the centre of the outlook opening to the walls, etc, or the roughing in dimensions, as they are called, vary with nearly every closet.

Latrines are used chiefly in prisons, factories, etc. and are set up in ranges of two or more Partitions are placed between each latrine about twenty-four inches apart. The waste pipe section is usually five or six inches in diameter and the flush pipe three or four inches. They are flushed by a large tank located about six feet above the seat, the flush pipe being connected to the bottom of the latrines.

Closet ranges used in schools, factories, etc, are merely large troughs with one outlet and a flushing arrangement. They should be simple, and have no mechanical parts to get out of order. There are many different kinds, but the automatic supply range is probably the best. The combinations are of three lengths, 24, 27 and 30 inches between partitions; height from floor to top of seats 1 foot 6 inches; height from floor to top of iron partition 5 feet 10 inches; depth of partition 2 feet 2 inches; width of range from front to back 1 foot 7 inches. If a hot chimney is near, it is advisable to use local vent closet ranges, and in such cases allow 15 inches extra length for a ventilating extension.

Closet seats should be made of hardwood and the grain arranged so that the seat will not warp, sliver, or fall to pieces. Quartered oak, in two or three layers crossed, or in one piece with dowels or cross strips, seems to be the best

material. The seat should be secured to the porcelain bowl. The hole should taper from back to front and have the shape and dimensions and the upper surface of the seat properly countersunk.

Many closets are provided with horns above the water line in the bowl. These are of no use, however, unless a strong positive draught is constantly maintained in the vent lines. The size of vent pipe is preferably 3 inches for each closet and not less than 2 inches. Two or three closets may local vent into a 4-inch pipe, the size of the pipe increasing with the number of closets connecting to it. All closets having horns attached to them for back venting traps should be discarded, as these horns easily break off. All connection between metal pipes and porcelain should be bolted flange joints without horns.

Floor Connections. The ordinary brass bolted floor flange makes a good connection, but if it is not perfect there are no means of knowing the fact One of the best is a water-sealed floor connection. The pipe is continued $1\frac{1}{4}$ inches above the finished floor, the end being rounded and free from burrs. The floor is countersunk to receive a supporting flange, which is attached to the pipe. A brass flange compresses the rubber gasket against the porcelain when the bolts are drawn up. An annular space is thus formed around the neck of the pipe, which fills with water at the first operation of the closet thus sealing the connections. If the connection leaks, this water will run out on the floor, and if it does not, gas cannot escape.

Closet Cisterns. There are a variety of kinds of closet cisterns on the market, some being simple and others complicated. In choosing a closet tank, first, select for flushing qualities, second, quietness in action, and third, simplicity of construction.

Urinals. Urinal ranges are lipped troughs with partitions set usually two feet apart. They are most satisfactory when flushed by an automatic siphon tank, which discharges through a large jet at the upper end and a spray tube at the back. The tank should be at least four feet above the spray tube. The outlet to trough should be arranged with a siphon, which will automatically discharge contents when the supply tank discharges. The period of automatic flushing varies with the water supply. Good flushes are obtained if the interval is from five to ten minutes. Urinal ranges are made of cast iron, plain, painted or preferably enamelled. The usual dimensions of a urinal range are about as follows:—Height of partition, 5 feet, 8 inches; width of partition about 1 foot, 6 inches; width of urinal, from bask to front of lip, 11 inches; depth of trough, 6 inches; regular height of lip, 2 feet. Individual urinals are made of porcelain and are provided with at least two openings, one for flush and the other for the discharge. The best class have perforated flushing rims and overflow openings inside. They are known as flat or corner urinals. The best forms are those in which the trap is combined with the bowl and arranged to be connected without any metal being exposed. The connection between the porcelain and the metal is usually water-sealed, which is advantageous. The waste pipe is provided with a flange and bolt for making a perfect junction with the earthenware. When a flushing tank is used the combination is simple, efficient, and hygienic. Individual urinals are set in stalls, the height of which should be at least 5 feet 6 inches, width inside 2 feet, length of partition 2 feet 4 inches, depth of middle partition 1 foot 8 inches, middle partitions stand on nickle plated brass legs about 10 inches high. The size of urinal cisterns should be, for two urinals a 2 gallon cistern, three urinals a 3 gallon cistern, etc. I may add that a decided improvement towards cleanliness will be made both in closet and urinal floors by installing at the time that closets and urinals are being fitted up in buildings a marble slab and lots of sunshine, which will do

more to keep closets and urinals in a sanitary condition than anything else, because where a slab exists there is a disinclination on the part of the last user to become careless. Again, a general closet or urinal system should never be placed in a cellar or basement, but should be located where plenty of ventilation can be obtained, and should open to the outer atmosphere, either direct or by air shafts at least three feet square.

Emery and Corundum Wheels.

The bursting of emery and corundum wheels usually carry with it much injury and sometimes loss of life to the operator, and it should be of interest to every user of those wheels that every safeguard should be provided to guard against accidents to human life, while at the same maintaining the efficiency of the wheels. Again, manufacturers of those wheels should exercise every precaution to ensure only perfect wheels being sold. However, many things can be done that will lessen the probability of accidents from the bursting of those wheels, and care should be taken to purchase only first-class wheels of the highest quality. A thorough inspection should frequently be made of each wheel to detect flaws, and the wheel should be so adjusted on the spindle that the latter will not become heated from friction. Again, the speed of those wheels should be kept well in view, and the safest course to follow is that of guarding against speeds in excess of that given by the makers of the wheels, who should understand the construction and quality of the wheels. It is also very important that the machines on which wheels are mounted should be heavy and strong, and firmly bolted to a firm foundation. It also happens that one wheel is oftentimes expected to handle too large a range of work, which is not good in practice, and it will be found more satisfactory to have several different grades of each shape for grinding iron, brass, composition, both hard and soft steel, etc. Moreover, wheels should be kept true and in balance, and the operator should use the wheel drawn up as close to it as possible, just allowing sufficient clearance to relieve friction. Wheels have burst where the rest was so far from the wheel that the work being ground would catch between the revolving wheel and the rest, which formed a wedge. The sudden stopping or checking of the wheel will in many cases cause it to burst. Guards made in the form of a hood, made from heavy boiler plate or wrought iron can be attached to those wheels and thereby diminish the number of accidents to the employees. With such a hood covering an emery wheel, in the event of it bursting, the fragments will lodge in the top of the hood, rendering it almost impossible for them to be thrown from under the hood in such a manner as to injure the operator, as the force of the fragments have been expended against the hood. This device, or any other, should be used where it will become a life saver.

Explosions and Fatal Accidents.

Two boiler explosions occurred during the year, one at John Whitehead's sawmill, Cultus, which was responsible for the death of Michael Aspden, Thomas Aspden, Charles Hanard, George McCallum, and Freeman Moffatt. The other explosion was in the Niebergall Stave and Lumber Company's mill at Staples, when Ralph Walsh was instantly killed and several others injured.

Fatal accidents from other causes are as follows:

August Hannaberg, killed by the bursting of a tire in C. Bauer & Company's Works at Waterloo.

Charles McDonald, killed in the Columbia Handle Works Company at London, while engaged in sawing a piece of lumber. It appears the lumber flew back and struck him in the abdomen.

W. T. Lobb died from the effects of falling into a pan of acid in the Canada Chemical Company's works at London.

William Minners, killed by falling from a scaffold while oiling machinery in the Grey and Bruce Portland Cement Company's Works in Owen Sound.

John McCann, killed by elevator in the Puritan Knitting Mills at Toronto.

Mark Robinson, died from the effects of gas when cleaning the inside of a cider tank in T. Allen's Vinegar Works at Norwich.

Boiler Inspection.

There is a strong demand for having the present law changed which would provide for both a rigid and quick inspection of steam boilers where they are not insured in some of the duly authorized boiler insurance companies for the Province. We find on our tours of inspection that the engineer can hardly be held responsible if accidents occur, because too often we find that he is the man of all kinds of work, being at the call of almost every person in a factory building, which, of course, takes him away from the engine room, where something may go wrong which would sacrifice both life and destruction of property. Moreover, we should be in that position when we either observe something dangerous about the boiler or receive a complaint that a steam boiler is considered unsafe, that we could secure a certificate of inspection within a reasonable time, as I believe that all possible safeguards should be provided for those employed where steam boilers are used.

Velocity of a Jet of Steam and of a Jet of Water flowing from the same Steam Boiler.

Under this head the question of how the steam injector is made to supply water to a steam boiler has been raised, and the following, with some examples, will, I am sure, satisfactorily answer that question, and be of some benefit to those operating steam boilers where the feed appliance used is the injector. There are numerous things connected with the whys and wherefores of a steam boiler that the beginner runs up against in the course of his experience which, to understand thoroughly, requires a fair knowledge of the laws governing velocity of steam and of water when flowing from the same boiler under pressure and when discharging into a medium of different pressure. This article will endeavor to explain how the velocity of a jet of steam or of water issuing from a boiler is ascertained, and consequently shows why when issuing from the same boiler or when issuing from separate boilers, but having the same initial pressure, there is so large a difference between the velocity of the jets. First, the question is asked, how can any person tell how fast the jet of steam will flow through an opening in a boiler? How do they measure it? Well, our first help in answering those questions will come from a careful consideration of the law of falling bodies. Suppose one stood on the top of a high steeple and were to let drop a stone from the hand, and that stone were to strike the earth in four seconds, how high would the steeple be? This latter question to the beginner in the subject of mechanical subjects is about as difficult to answer as the former is, but you will see what we can do with the latter question first. From experiments, which have been made with falling bodies, it is known that the acceleration of gravity is 32.2 feet per second practically. This means that if a stone be dropped from a height greater than 32.2 feet, the first second it occupies in falling its velocity will increase from zero at the beginning to 32.2 feet at the end of the second. If it continues to fall for two seconds, its velocity at the end of the 2nd second will be twice 32.2 or 64.4 feet, for it is gaining in velocity at the uniform rate of 32.2 feet per

second. At the end of three seconds occupied in falling its velocity will be 96.6 feet. At the end of four seconds 128.8 feet; assuming, of course, that the air does not offer any resistance, which it practically does not, to a falling stone. Now, we know that if the stone dropped from the top of the steeple, and it required four seconds to strike the ground, its velocity at the instant of striking the ground is four times 32.2, or 128.8 feet per second. It is the knowledge of this fact that is going to help us to determine how high the top of the steeple is from the ground. The first second the stone was falling it started with zero velocity and attained a velocity of 32.2 feet at the end of that second. As the gain in velocity is regular, or, as the book tell us, the velocity is uniformly accelerated throughout the time occupied in falling, it follows that the distance through which the stone falls will be equal to the average velocity throughout the fall multiplied by the time occupied in falling. As before stated, the body started with zero velocity, and at the end of the first second, it had acquired a velocity of 32.2 feet per second; so that dividing 32.2 by 2 gives the average velocity during the second, and multiplying by 1, the number of seconds occupied in falling gives the distance through which the body falls. The first second which would be in this case $\frac{32.2}{2}$ x 1 equals 16.1 feet. At the end of the 2nd second occupied in falling, the body will have acquired a velocity of 32.2 x 2 equals 64.4 feet per second so that $\frac{64.4}{2}$ x 2 equals 64.4 feet distance through which the body will fall in two seconds. At the end of the third second the falling body will have acquired a velocity of 32.2 x 3 which equals 96 6 feet and will have fallen through a distance of $\frac{96.6}{2}$ x 3, which equals 144.9. At the end of the fourth second the falling body will have acquired a velocity equal to 32.2 x 4 which equals 128.8 feet, and will have fallen through a distance of $\frac{128.8}{2}$ x 4, which would equal 257.9 feet. Therefore, the top of the steeple must be 257.6 feet from the ground. The rate at which a falling body acquires velocity varies somewhat between the equator and the poles, being slower at the equator and faster at the poles than at any other point on the earth's surface, but for the purpose of practical calculation no account need be taken of this. Let us suppose, now, that instead of a stone, it was a drop of water we let fall from the top of this steeple and that we let it fall through a perfect vacuum, it would strike the earth in exactly four seconds, and at the instant of striking would have acquired a velocity of 128.8 feet per second, the same as the stone had when it struck the earth. If we had a column of water 257.6 feet high contained in a pipe, and were to open a hole in the bottom, the water would issue from the opening at a velocity equal to that acquired by a drop of water falling from the top; because although the water at the bottom would not have so far to fall, the moment an opening was made there, the pressure upon it, due to the weight of the column of water above it, would cause it to issue at the same velocity it would have acquired due to gravity alone, had it started from the top and fallen through the whole length of the column, which would be the same as the falling stone, 128.8 feet per second.

With these facts concerning the falling body and the water issuing from the opening at the bottom of the water column, let us see what we can do to determine the velocity of water when issuing from an opening in a steam boiler under pressure. If the boiler carries, say 180 pounds steam pressure (absolute), it means that there is a force of 180 pounds on every square inch of the surface of the boiler, and also that all the water in it is under this pressure. To be a little more exact, we might say that there is a little more than this pressure on the water in the bottom of the boiler, because the weight of the water itself is something, but for our illustration this weight may be neglected. As there are 144 square inches of surface in the side of a cube of one foot, it follows that the total pressure on a square foot of surface of the boiler carrying 180 pounds of

steam will be equal to 144 x 180 or 25,920 pounds. Assuming that a cubic foot of water at a temperature of 373 degrees, corresponding to a pressure of 180 pounds absolute, weighs 54.34 pounds, a column of water high enough to produce this pressure (25,920 pounds) on a square foot of the surface on the bottom supporting it will be equal to 25,920 divided by 54.34, or in round numbers 477 feet. To find the velocity with which the water will issue from an opening in the boiler all we now have to do is to find what velocity a body will acquire in falling through a distance of 477 feet vertically toward the earth. To do this, we must vary somewhat from the rule used to find the height through which a body will fall in a given time due to gravity, which is, multiply the acceleration of gravity by the square of the time occupied in falling and divide this result by two. As our distance is 477 feet, twice this will be 954 feet, and this divided by 32.2, the acceleration of gravity, gives 29.6; the square root of 29.6 is 5.44, which is the time in seconds a body falling freely through the air will require to fall through a height of 477 feet. To find the velocity acquired by the body at the instant it passed the last foot, as already explained, we multiply 32.2 by 5.44 and we find it to be 175 feet per second. Therefore, if we open a valve in a boiler carrying 180 pounds pressure below the water line anywhere, the water will rush out at the rate of 175 feet per second. Probably, in a practical experiment to determine this, the velocity would not be so high, as some account would need to be taken of the resistance of the atmosphere at the opening, and if the water had to flow through a valve, and also a shorter length of pipe, of the frictional resistance encountered. But our method of determining the velocity of flow of the water from the boiler will always give results which will be found very close to what a practical experiment will show. A cubic foot of steam weighs considerably less than a cubic foot of water, both being contained in the same boiler, and in a boiler under a pressure of 180 pounds absolute per square inch, a cubic foot of steam will have a temperature of 373 degrees Fahrenheit and will weigh .3983 of a pound or nearly four-tenths of a pound. We learn from the foregoing that a cubic foot of water in a boiler under 180 pounds pressure weighs about 136 times as much as a cubic foot of steam in the same boiler under the same pressure. This may be found by dividing 54.34 by .3983. We saw that it required a column of water 477 feet high when at a temperature of 373 degrees to produce a pressure of 180 pounds per square inch on its base; it would require a column of steam $= \frac{180 \times 144}{.3983} =$ 65.076.6 feet to produce a pressure on its base of 180 pounds per square inch. But we cannot ascertain the velocity of the steam issuing from the boiler according to the same method by which we ascertained the velocity of the water because the steam acts so much differently; the moment it escapes from the opening it expands in a direction almost at right angles to the direction of the jet. This expansion is due to the internal pressure of the jet being greater than that of the atmosphere, and this, together with the work the jet does in pushing the air out of the way, lessens its velocity very considerably. In the case of the water flowing from the boiler, however, the resistance from the atmospheric pressure does not make much difference with its velocity, but we know that in the case of steam it does. Therefore it is better to consider the velocity of steam when allowed to flow from a boiler through a properly shaped nozzle The shape of the nozzle is such that the steam in escaping expands to atmospheric pressure before it leaves the mouth of the nozzle, and, therefore, there is no expansion at right angles to the direction of the jet the moment it leaves the nozzle. To determine the velocity of steam discharging through nozzles, numerous experiments have been made, and from these experiments formulas have been derived by the use of which a pretty close estimate can be made of the velocity of steam at various parts of the steam nozzle through

which it is flowing, and also at the moment it enters the atmosphere after leaving the mouth of the nozzle. At the entrance to the steam nozzle the velocity of the steam is nearly the same as would be found by finding the height of a column of steam of uniform density having the same weight as the steam pressure in the boiler produces on a unit of area of boiler surface. In other words, the velocity of the steam at the entrance to the discharging nozzle may be found by practically the same method employed in finding the velocity of water issuing through an opening from the boiler. But the moment the steam passes the entrance to the nozzle, it expands in the direction of its flow, and increases its velocity, and it is the velocity at the moment the steam leaves the throat of the nozzle that we wish to determine. Let us take the case of steam through a nozzle, and the height of a column of steam of the same density as that of steam of 180 pounds pressure has already been found. You will observe that it is considerably higher than a column of water under the same absolute pressure, and anything dropping from this height would have a much greater velocity when it struck the earth than it would if dropped from the top of a column of water of the required height for the same pressure, namely, 180 pounds. By experiment a formula has been found for calculating the velocity of the steam while passing through the entrance to the steam nozzle and this formula is: Velocity equals 3.5953 times the square root of the height of a column of steam of the same uniform density as that of the steam in the boiler required to produce the given pressure on its base. In our case the absolute pressure is 180 pounds, the height of the column of steam required to produce the same pressure (180 pounds) is 65,076 6 feet, and the square root of this is 255.1, and 255.1x3.5953 equals 917 feet, the velocity of the discharging jet of steam as it enters the passage to the nozzle. This we learn is a considerable swifter speed than the water had in coming out of the same boiler. But, as I have already remarked, the steam expands on its way to the nozzle, its pressure falls, its volume and velocity increase. Experiments have shown that the ratio of expansion is about 1,624, so that the final velocity of the steam at the moment it passes through the throat of the nozzle would be equal to 917 feet (the velocity of the steam in the entrance to the nozzle) multiplied by 1.624, which equals 1,489 feet. We have now seen that water and steam issuing from the same boiler, under the same initial pressures, have widely different velocities, and have learned something of the way in which the velocities are ascertained. What we now know of the difference in these velocities will help us considerably in obtaining a clear, satisfactory conception of the principles upon which the injector is constructed, and to understand why this appliance for feeding the boiler is able to take up water and to force it into the same boiler from which the steam is taken against the same pressure as the steam has that is operating it. In the injector a jet of steam issuing from the boiler is made to come in contact with a supply of water, cold enough to condense the steam immediately at an opening connected by piping to the water space of the boiler. The high velocity of the steam, as it condenses, is imparted to the particles of water and this water flowing into the orifice or opening passes into the boiler with considerable force and velocity. The injector is a convenient means of feeding a boiler, but is not economical because of the high velocity at which the water is made to enter the boiler. Its advantages are its simplicity and convenience and the fact that the water is heated by it before it enters the boiler. Its disadvantages are that it takes so much steam for the amount of work done and that it is so easily put out of work by some little chip or impurity in the water, or by becoming heated up—as its successful working depends upon the condensation of the steam as it issues from the nozzle in the injector.

In conclusion, I issued several hundred notices during the year which related to the following safeguards:

Child labor, elevator trap doors or gates, hand rails for stairways, etc., guarding well-holes, openings through floors and walls, modern balcony fire-escapes, belt shifters, loose pulleys, vats, flumes, dangerous machinery, etc., exhaust fans, heating, ventilation, safety of buildings and leaking roofs, water-closets and urinals, drinking water, sanitation and cleanliness and boiler inspection.

In nearly every case I found the employer willing to meet my instructions, and I find that the employer who does not recognize or does not care for his responsibility towards those employed under him is rapidly diminishing, and in a great many cases it is claimed that the more often the employer sees the factory inspector the better.

A list of accidents reported during the year which occurred in my district is herewith appended.

All of which I have the honor to submit.

Yours most respectfully,

JAMES T. BURKE,
Factory Inspector.

REPORT OF INSPECTOR THOMAS KEILTY.

To the Honorable the Minister of Agriculture:

SIR,—I have the honor to submit a report of the inspection of factories and shops in the district assigned to me for the year ending December 31st, 1905.

I am pleased to inform you of the steady and rapid growth of industries throughout the Province. Each visit of the Inspector finds new industries established, and older ones augmented by additional space to make room for the increasing demand for manufactured articles. It is also pleasing to note that new factories are being established as well as old factories being enlarged, and in most cases these are provided with all modern appliances to date, namely, light, heat, ventilation, and such other sanitary appliances as may contribute to the safety and comfort of the employees, as well as the quality and condition of the material being manufactured. This is very pleasing to the Inspectors, and shows both good judgment and enterprise on the part of the manufacturer. Of course, there are some, and I presume there always will be some, who persist in old methods with antiquated machinery congested in such a manner as to render their operation most ineffective. Such machines are in addition, usually surrounded with a lot of refuse, thereby making the labors of the operator more hazardous. These places require the constant attention of the Inspector, and to my mind such manufacturers were never intended to play a part in this scientific manufacturing age, and are sure sooner or later to succumb to their more enterprising competitors.

In the case of new factories, outside of Toronto, it is very seldom that the Inspector is notified of their establishment, as required by sections 33 and 51 of the Act. This in some cases is due to the want of knowledge of the requirements of the Act, and in others it seems that the question of notice is obscured in the details incidental to getting started. This, however, is a very unwise oversight; I will call it that, because I do not imagine it to be a wilful violation of the law. When the Inspector arrives, in many cases costly changes have to be made to meet the requirements of the Act. I mentioned this on a former occasion, but believe it to be of sufficient importance to keep well before those who contemplate establishing new factories or making extensive alterations. It is also well for such persons to secure a copy of the Act, and arm themselves with all the information available, so that when their factory is finally established, it would be well within the meaning of the law. The inspectors are, and always have been ready and willing to furnish any information available in this respect.

FIRE ESCAPES.

Factories are gradually becoming better equipped in regard to fire protection. In addition to a growing public sentiment as to the fullest measures of protection against fire, and a proper and safe means of escape in case of fire, the owners of factories in most cases realize an individual responsibility. Besides, the manufacturers in many smaller towns find it to their advantage to build larger buildings with less elevation, mostly of one or two storeys, from which there would not be much difficulty in escaping in the event of

fire. We still have the cities, where lack of space demands higher buildings. There are also many buildings that were never intended for the purpose for which they are occupied, and the constant changing of premises often make what might be considered practical fire protection a serious question. Then we have so many places that do not come within the jurisdiction of the Inspectors which are poorly equipped with fire protection, especially in the city of Toronto. Such places are put before the Inspectors as an example of a standard away below what the Inspector demands. In this respect, an example of the work done in the city of Ottawa two years ago is well worthy of mention. The City Council passed a by-law compelling the owners of all buildings, such as factories, tenements, boarding houses, and also public buildings, such as theatres, schools, hospitals, offices, etc., to provide the same with suitable fire-escapes as directed by the city building inspector. In conversation with the city building inspector, he told me that he had no trouble in having the by-law complied with. He and his assistants took up the work by streets, going over each place thoroughly, serving the owners with a formal notice where there was occasion, and giving reasonable time in which to comply with the law, after which the work was formally inspected and passed. In this way the whole city was gone over within a year, and is considered now in a safe condition so far as escape from fire is concerned. The great advantage of this system is that once done it is done in such a way that it requires no further attention for some time, as all new buildings or alterations would come before the building inspector for permits. It appears to me that such a system would work well in Toronto and one or two other large cities, and would remove much of the trouble and dangers referred to. I scarcely need again advise that the fire protection provided by the Shops Act is wholly inadequate, and works injustice in its operation. I have in mind one instance during the past year where a merchant and manufacturer in the city of Toronto fitted his premises with the requirements of the Shops Act, as a shop, and later in the year he provided the fire-escapes required by the Factory Act, partly because he had installed some workmen on the premises and partly because the fixtures formerly provided as required by the Shops Act were considered very unreliable. I would, therefore, hope that you will see the necessity of urging the providing of more uniform legislation in this respect.

Laundries.

Laundries have given very little trouble during the year. In fact, the machinery used in these places is usually equipped with all safety appliances to date. The greatest difficulty encountered in laundries is the accumulation of steam, especially during the winter. Much has been done by way of ventilating fans and natural draught to remove this trouble. But under the climatic conditions to which we are subject in this country, it is reasonable to suppose that this trouble will always appear in a greater or lesser degree. The same trouble is also present in steam dye houses and hat factories, especially the latter.

Bake Shops.

Of this class of workrooms little fault is to be found. The nature of the industry in competition makes it absolutely important that the strictest attention be paid to sanitary conditions, which is in fact the body of the Bake Shops Act.

Brick and Tile Factories.

This line of industry received my earnest attention during the past year, as these factories did not come under the Factories Act until recently. A system of educating the owners to the requirements of the Act was found necessary. It is needless to say that while in most cases a comparatively small number of men were employed, the very movable nature of the work, and other conditions surrounding that industry made the work of an Inspector most fruitful. In nearly every case, I find the season of this industry very short owing to climatic conditions, which almost entirely control that industry. The plants closed down during the winter months tend to deteriorate more rapidly than if constantly used, especially the motive power. The boilers, where such are used, are generally poorly housed, and present opportunities for scale and rust incrustations, which would not occur in boilers continually in use and properly housed. Other conditions were that where children were employed at light but very tedious work, such as sanding moulds, the machinery of such places is usually of a simple type and are set up in a simple manner, owing no doubt to the frequent changes of location. I am pleased to say, however, that in each case, the owners or proprietors seemed desirous to enter into the full requirements of the law.

Boiler Inspection.

This subject has received the earnest attention of the Factory Inspectors for years, and so much has been said, and so many theories advanced in the demand for more active legislation, that little is left except to record the different experiences that each succeeding year brings forth. In this respect the past year has added its quota to the long list of casualties already recorded against defective boilers, and want of a proper knowledge of their use. It has been frequently pointed out that certain precautions should be always maintained in the use of boilers, and just as often have the Inspectors found these precautions completely ignored. It is true that owners of many of our larger and some of our smaller industries would be desirous to adopt any method of safety that might be suggested to protect their property and the lives of those who might be endangered even though such methods were not a statutory law. Then, we have others whose sole purpose is to evade the simple law from ever point of vantage. The many defects in the present law do not require reproduction, but I might with justice point out one instance that came to my notice within the past few months which further proves the inefficiency of the present law. A boiler explosion occurred in a certain factory in my district. Upon investigation I was informed that the boiler had been duly inspected by an inspector qualified as provided by law, but such inspector had given the owner no certificate. In fact he did not think a certificate was necessary. In the meantime another boiler was installed which was not a new boiler. For this latter boiler I demanded a certificate, which was returned by this very same qualified inspector. The certificate read that the boiler had been tested to 100 pounds cold water pressure and that he had set the safety valve to blow off at 100 pounds, and that he considered the boiler safe and in good condition. Further comment as to the fitness of such men to inspect a boiler is unnecessary, even though they are qualified by law. In my opinion there is no part of our factory legislation so weak and unjust as the laws pertaining to boiler inspection. The Inspectors have hoped, from year to year, that some more effective and justly workable amendments would be added to the statutes, or that the Stationary Engineers' Bill, so often before the Legislature, would have been considered

in the interests of progressive legislation. So far such hopes have been doomed to disappointment, and for this I am unable to offer any reasonable excuse. In fact, no reasonable arguments have been advanced against such a proposition. The requests made have but one object, namely, to equalize the requirements, and render their operation more effective. In support of this claim we have the advanced legislation of other provinces in operation long enough to prove its justice and effectiveness. In the Province of Quebec, the laws relating to boilers are much in advance of the same laws in Ontario. In British Columbia, the Steam Boiler Inspection Act has been in operation for several years, and proves most effectual. Like the laws of Quebec, it also provides for the inspection of materials entering into the construction of new boilers and repairs. In the Inspector's report of 1902 it is stated that 10 per cent. of the plates entering into the construction of new boilers would not stand the inspection tests and were consequently condemned. As the cost of replacing these plates usually falls on the supply houses manufacturers are most careful as to the quality of materials sent to British Columbia customers. The chief boiler inspector, who is a man with a lifetime of experience in the construction of boilers and machinery, states that too much care cannot be exercised in the physical and chemical properties of steel to be used in boiler construction. Acid and basic Bessemer steel is unfit for boilers, and so is basic Siemens-Martin steel if made of phosphoric pig. The latter, however, if made of good pig, is satisfactory. Another part of his report refers to the dangers encountered by the importation of defective boilers from other parts. For example, he says: "Eighty-four cases of insufficient staying, twenty of which were dangerous, call for some comment, and in almost every case were found on cheap boilers, quite a number of which were purchased from second-hand machinery dealers in the United States and Eastern Canada before the Act came into operation," while some cases were those of new boilers sent in from the United States. He cites the case of a farmer who ordered a threshing machine from an American firm to carry 150 pounds pressure and who became suspicious after placing the order, and asked for a Government inspection. The stays were found insufficient. He wired the company to that effect. They replied, "Accept engine; will make good." Subsequently, the firm's agent offered the farmer $200 to get the repairs made himself. This was refused. The deficiency is now being made good by a British Columbia Company at the American firm's expense. This is a case where one man was saved $200, by the working of the Inspection Act. He also cites a case of a new return tubular boiler built in the United States, having four one-inch stays supporting the segment of the head at one end and seven one-inch stays supporting the segment at the other end, the latter being insufficiently stayed. This means that four stays would be carrying a load of about forty-six tons, if the boiler was carrying an ordinary pressure of 100 pounds to the square inch. To this he makes the following comparison: "I am inclined to think that if forty-six tons were suspended over a side-walk by four one-inch bolts, there would be a tendency for most people to walk on the street instead of passing under the weight, and yet these same people would feel perfectly safe near this boiler, simply because they would not realize the danger in the same manner as they would if they actually saw the weight suspended." The foregoing is significant inasmch as it points out some of the needs of technical knowledge required in the inspection of boilers, as well as the effect of practical legislation applied. In placing those facts before you, I feel that in justice to all parties, amendments should be enacted that would secure greater justice and protetion for all parties concerned.

Female and Child Labor.

In my report of last year, I reviewed at some length the evils of child labor and its consequences and effects on future generations. My remarks were freely commented upon by the press and public, especially those who were interested either from personal reasons or in the upbuilding of the nation. As to the former, I would say that the object of the Inspector is not to exaggerate, or to draw conclusions of an impulsive or personal character, but to lay before the head of his Department the actual conditions that exist, pointing out their benefits or evils as the case may be, and suggesting what appears the best method to overcome such evils or abuses. To the latter class is due the credit of accepting the Inspector's reports in the true spirit in which they are intended. No person will attempt to deny the existence of child labor in this Province. As to the extent of such labor, the Inspectors do not apprehend serious consequences so long as prohibitory laws are enacted and enforced. But by this we do not mean prohibitive measures that would be unjust to any person. It is true that climatic conditions have much to do with the extent of child labor in this country. Competition and the human characteristics of manufacturers and parents would make child and female labor as great a menace in this country as it is in the southern States, if opportunities and climatic conditions were equal. It is the prevention of the inception of such conditions at which the Inspector aims. When I tell you that to-day we have in this Province women working in foundries, machine shops, and breweries, some of the weaker sex, and not a few of their champions, will be surprised. I do not mention this as meaning to say that labor for women or children is degrading, but rather to show ample reason why they should be protected. President Roosevelt in his message to Congress this year has pointed in no uncertain words to the needs for more active legislation to protect the factory girls and women of the United States; and his references are largely as to the effect of propagation by the present race and the degeneration of future generations. We should not need inspiration from President Roosevelt. We have ample proof of this evil. It is now, when our country is growing at such a rapid pace, that we should set up a standard in every walk of life that will not be subject, in later years, to the inroads of commercial despotism. It has been my experience during the past year to visit one factory where I found twenty-two children employed who were not of the required age; others varied to some years. And while the occupation in which those children were engaged did not seem entirely harmful from a physical standpoint, yet the most important point, that of education, was being sadly neglected. In this respect, the inspectors do not usually receive the support they should from truant officers and boards of education. Very little good would be accomplished if the factory laws were fully observed and the school requirements allowed to go by default. Another phase of this question presented itself in the factory mentioned above, and one to which I referred in last yar's report. That is, where a child is absolutely dependent upon his own resources for his daily sustenance, and in some cases even weaker persons are dependent on this child for their support, there should be some means of enabling such children to receive at least a common education without breaking up a home or separating a family. In the cases referred to, the superintendent in going through the works, told me a pathetic story of the circumstances of one or two boys engaged in the premises. I told him to let their cases stand until I had an opportunity to investigate them. In the course of a week I learned that what he told me was true. In the meantime I had tried among those charitably disposed to

find some assistance for those cases, knowing full well that ultimately they would have to be removed from the mill, and consequently what was their only source of daily bread. Returning to the mill, the superintendent told me that something would have to be done in the case of those boys, as the parents of other boys who were dismissed had threatened to withdraw older members of their family from the works, if their boys were not reinstated, claiming that their children had as good a reason to work as those poor children who had no one to protect them. Of course, the Inspector has no alternative but to do his duty and enforce the law. The above instance proves the wisdom of the factory laws in providing the one rule for all, but it would seem that some condition could be provided in the educational laws that would take care of such cases. I am pleased to note that each year brings about a better observance of the laws relating to child and female labor, but, as stated in other reports, there is room for more uniform legislation. This especially refers to the canning industry, shops, offices, hotels, and other such places where females and children are employed.

Overtime Permits.

I am pleased to inform you that manufacturers generally do not consider it profitable to work long hours, and it is only in cases of necessity as provided by law that overtime permits are asked for. Although the law does not apply as to the number of hours men shall work, yet in almost every case, wherever it is practical, the tendency is to shorten the hours rather than increase them. This evolution of industrial conditions has been coming about for a great many years. As long ago as 1846, Thomas B. Macaulay, the eminent British statesman, in a splendid speech delivered in the House of Commons, defending the rights of state to interfere in the contracts of individuals, said: "Where health is concerned and where morality is concerned, the state is justified in interfering with the contracts of individuals," and he appealed to the Acts already in force to prove that the results of shortening hours by law were beneficent rather than disastrous. I do not mean to say that a man will not produce more in a week working seven days than by working six days a week, but I very much doubt whether at the end of the year he will have produced more by working seven days than by working six days a week, and I firmly believe that at the end of twenty years, he will have produced much less by working seven days a week than if he had worked six days a week. In the same manner, I do not deny that a factory child or woman will produce more in a single day by working twelve hours than by working ten hours, and by working fifteen hours than by working twelve hours. I do not deny that a great society in which women or children work twelve or fifteen hours a day will in the lifetime of a generation produce as much as if they had worked shorter hours. Rely on it that intense labor beginning too early in life, continued too long every day, stunting the growth of the mind and leaving no time for healthful exercise, no time for intellectual culture, must impair all these high qualities which have made our country great. Your overworked boys and girls at a tender age will become a feeble and ignoble race of men and women, and the parents of a more feeble progeny. Nor will it be long before the deterioration of the laborer will injuriously affect those very interests to which his physical and moral energies have been sacrificed. Never will I believe that what makes a population stronger and healthier and wiser and better, can make it poorer. If ever we are forced to yield the foremost place among commercial nations, we shall yield it to some people pre-eminently vigorous in body and mind. England is the home of factory legislation dating back to the year 1802,

when the elder Sir Robert Peel had placed in the statutes an Act entitled "Health and Morals of Apprentices," which was expanded by Robert Owen into a general principle of industrial government. From the experience of all these years, there is much to be learned that would make experimental legislation almost unnecessary. We find the English Factory Act as revised to date most comprehensive, covering every detail of industrial life to be found in that country. It has the peculiar growth of more than a century, each section being framed individually, and covering in some cases the investigations of commissions extending over years of practical research.

Guarding Machinery.

One of the most useful laws that appears on the English statutes is that relating to safety or protection required for certain dangerons parts of machines before being exposed or offered for sale. This law is most commendable, and would apply equally well in any country. The question is often asked the inspectors, when suggesting certain protection for dangerous parts of machines: "Why is not this protection provided by the makers of those machines?" It is true that if our factory laws provided that a certain standard was to be maintained, it would be better for all parties concerned. It is also true that very little attention has been paid to the safety conditions by the manufacturers of machinery, such safey conditions have been observed in the great desire to produce machinery from a point of labor-saving or productivness in quantity or quality. This is based largely on American principles, and our manufacturers of machinery have to meet the competition of American manufacturers in the production of machines with no other standard than that of production. It has been difficult until late years to get our manufacturers to produce even simple guards to protect dangerous parts of certain machines. When the owners of such machines would ask the inspector: "Where are they manufactured?" we would have to refer them to some foreign manufacturer.

Other Factories.

Such other factories as come within the meaning of the Factories Act have all received my earnest attention during the year, and I am pleased to say are gradually improving in safety and general conditions.

It would be absurd for an Inspector to claim a universal knowledge of all the details of factory life. With the general observations that are daily before them, added to the special statistical reports that have been gathered by men who have devoted years of study to different phases of factory life, it is quite within the province of an Inspector to lay before you much valuable information; in fact, just as much so as if it were the individual experence of the writer; and to my mind it is of great value, being the product of different master minds all centering on one object, namely, the welfare of the industrial classes and the protection of the public.

Factory Sanitation.

The welfare of the laboring classes has always been a subject of greatest importance and a most far-reaching influence, socially and politically. The hygienic conditions existing in some places are unjust to the working classes and sometimes react with serious results to the public. The aspiration of the working classes to improve their condition in respect to sanitation is justifiable, and by all means should be encouraged. With the multiplication of factories and the increase in what was considered hereditary diseases, the improvement in the conditions of factory life has become a vital

question. Statistics and clear thinking convince the worker of the dangers to which he is exposed by the conditions of his employment. Under the influence of long continued work under unsanitary conditions, the physiques of those employed in factories often show more or less characteristic marks. The heighth is usually below medium. The body, weak and thin, is poorly nourished and of a sickly paleness. The spiritual and moral life may likewise become inactive and apathetic. Even the strongest factory workers under such conditions become more or less exhausted before they reach fifty or fifty-five years of age. Many of those who work in cotton or woollen mills or generally in plants where a high temperature is maintained and lack of pure air are cut off prematurely. Women suffer even more than men from the stress of such circumstances, and more readily degenerate. A woman's body is unable to withstand strains, fatigues and privations as much as a man's. This makes her condition worse, because her wages or earnings are comparatively smaller. According to a statistic report of C. F. W. Doehring, M.D., prepared for the Department of Labor in Washington, D.C., in 1903, the diseases which most frequently afflict the working classes are disturbances of the nutritive and blood-forming processes, and workmen or women employed in branches of industry where work is done in cold, hot, or close, poorly vetilated rooms, are especially subject to such diseases. Among the diseases to which workmen in such occupations is subject are insanity, scrofula, pulmonary consumption, dropsy, rheumatic troubles, pleurisy, and typhoid fever. He further states that every epidemic, be it typhoid fever, smallpox, scarlet fever, dysentery, cholera, etc., draws its greatest army of victims from this class. For every death that occurs among the richer or higher class there is a greater percentage of fatalities among the working class. All the harmful influences which affect the industrial classes should be thoroughly studied, and an earnest effort made towards their amelioration or removal, not only that the interests and health of the weaker members of society be protected, but also because the health of society in general is both directly and indirectly menaced by unsanitary conditions in any industry. When we go back to those causes to which civilized nations owe their advance in culture and social conditions we find that one of the most important and essential causes of this undeniable advance lies in the deeper recognition of those natural conditions upon which depend the life and well-being of the individual and thereby the prosperous development of society. Science alone would have aided but little in any real elevation of the general conditions of well-being. Science had to descend to meet the necessary demands of daily life. It had to make the laws and needs of human existence, the object of its most comprehensive researches. It had to bring to light their relation to, and connection with, the external conditions of life. It is by those means that rational rules of life may be formulated. It is in the manifold transgressions of those laws, in the unreasonable gratifications of certain needs, in the ignorance and disregard of injurious influences, that the causes and sources of many evils are to be found, and such evils are especially prevalent in the conditions which surround industrial establishments and their workers. The concentration of population in large manufacturing centres is not in the interest of public hygienic and economic principles, as might easily be assumed. The increase of manufacturing industries in our larger cities is most remarkable. The factory is the symbol of those cities, and steam and electricity the rulers. It is, therefore, of utmost importance that there should be a systematic education in respect to the many dangers which in some industries threaten the workman and the public. There is also room for technical preventive measures based

on a sound practical foundation with the object of removing all the causes of existing evils that endanger or injure the health. There is in the industrial world little of that seclusion which made the discovery of natural laws the closely kept secret of guilds or schools. The great value of open intercommunication and instruction relating to factory sanitation, labor protection, and the preservation of life, is recognized. The individual attainments under such conditions are of great value to the country at large, as they smooth the way for those who aim at similar results and make success more certain. The inhalation of pure air containing a certain amount of moisture is considered one of the first conditions for the preservation of health. The external air varies in temperature and degrees of humidity according to the seasons of the year and atmospheric conditions. In factory rooms the air suffers many alterations injurious to the workman. Sometimes these alterations are due to the peculiarity of the industry. Usually, however, they coincide with the deterioration caused by the inhalations and exhalations of the workers. This is hastened by the use of illuminating gas or petroleum. The air is also vitiated by dust which develops in various industries. The latter will impair the health and directly or indirectly the life of the workman. The dust generated from the following materials is known to be especially injurious to the health, namely, carding machines, emery grinding, polishing or buffing, cleaning castings, foundries, tumbling barrels, granite, marble or sandstone factory glass and flint in sandpaper brick or crockery, cement or carbide works, sandpaper on wood (all kinds), chloride of lime, all kinds of colored paints, chemicals in dry powder, injurious varieties of gases in all chemical and many other industries, but it is possible to remove them easily and practically. Those arrangements whose purpose is to avoid completely the generation and diffusion of gases, do not really belong to the subject of ventilation, for they make special ventilation unnecessary. However, in respect to their effects, they can be placed side by side with the improvements that are to be obtained by the way of ventilation. In some countries extensive studies have been made in the ventilation and humidification of certain factories where high temperature is maintained. The influence of certain vocations upon the length of life has been the subject of statistical investigations in the older world, and I feel that it will be useful to reproduce them here as given by Rhoe, an eminent physician of Massachusetts, who ascertained the average length of life in that State as shown in the following statement: —

Factory workers	36.3 years.
Craftsmen	50.8 "
Farmers	65.3 "
Workmen without definite vocation	47.4 "

Hirt and Oldendorff, eminent statisticians and doctors, compute the average length of life of persons engaged in various occupations as follows: —

Stone cutters	36.3 years.
Glass grinders	42.5 "
Agate grinders	45.48 "
Cotton workers	47.50 "
Printers	54.3 "
Dry grinders	42.0 "
Wet grinders	45.8 "
File cutters	43.8 "
Filers	46.3 "
Locksmiths and blacksmiths	46.3 "
Iron workers	45.8 "

The above statistics were compiled in Germany. Very characteristic are the following statements obtained from English sources relating to English conditions. In England, the average length of life among the higher classes is forty-four years, among the middle classes twenty-five years, and among the laboring classes twenty-two years. The infant mortality among the higher classes is one death to every $4\frac{1}{2}$ births, among the middle classes one death to every $2\frac{1}{2}$ births, and among the laboring classes one death to every 2 births. The general mortality shown for the whole country (England) is 22 out of every 1,000, for the higher classes 17 out of every 1,000, and for the laboring classes 36 out of every 1,000. Ogle calculates that in England the death rate among all men from 25 to 45 years is 10.1 per cent. Ramazzina, the first to attempt a systematic investigation of industrial diseases (1713) divided the resulting diseases, injuries, and disturbances of health according to their causes into two categories. The one includes those whose causes must be sought in the material employed. The other those which result from the movements, positions of the body, and exertions customary in work. Both can be considered as the immediate result of employment in certain occupations or may be called occupational diseases or injuries. To those two may be added a third group, in which the causes of the injurious influences upon the health are found to be due to the unhealthy or dangerous condition of the workroom. As a hygienic precaution, the material should be examined from two points of view. First, whether it is of such a nature that its use gives occasion for the development of dust, or whether it is poisonous, and in itself consists of substances injurious to the health. The question of dust generation is of first importance because of the great number of diseases caused by its inhalation. Catarrhs of the respiratory organs are usually the immediate and first result of the inhalation of dust-laden air. Other disease processes, chronic pneumonia, for example, may also result from continued exposure to dust inhalation. According to Oldendorff, of the total males above twenty years of age in the eight communities of the districts of Solingen, Lenrup and Metruan, 46 per cent. died of pulmonary consumption, among the iron workers 59.1 per cent., and among the grinders 78.3 per cent. According to Hirt, of 100 diseased workingmen suffering from phthisis, 28 were exposed to metallic dust, 25.2 to mineral dust, 13.3 to vegetable dust, 20.8 to animal dust, 22.6 to mixed dust, and 11.1 to no dust. Dr. Perlin reported that of 1,425 consumptives treated at the Munich Polyclinic, 30 per cent. had been exposed to metallic dust, 18 per cent. to mineral dust, 26 per cent. to vegetable dust, 17 per cent. to mixed dust, and 8 per cent. to animal dust. This shows that the men exposed to the inhalation of irritating dust contributed the largest percentage of consumptives. Of the flint stone workers 80 per cent., and of the flat stone workers 40 per cent., were attacked with tuberculosis. The doctor qualifies the above statements by saying that dust alone as such does not perform the entire operation in the development of pulmonary diseases, but paves the way, and often becomes the bearer of the true bacillus of tuberculosis. It is further said that the respiratory organs do not afford the only means by which the various kinds of dust may exert their injurious effect. Not infrequently, the dust particles, which likewise are the bearers of pathogenetic micro-parasites, gain access to the system through slight abrasions of the skin and cause general diseases (malignant pustules), rag pickers' disease, glanders, and also affections of the eyes. Below is given a list of the several poisons which enter into manufacturing of the present day, and the several branches of industry in which they are used. It must be said, though, that the continued advances of science and industry work frequent changes in these groups, partly because of the introduction of new poi-

sons, and partly because of the substitution of other materials for the poisons in use. The list of poisons and occupations or industries in which they are used is as follows: Ether fumes by photographers; ammonia fumes by tanners, tobacco workers, tin plate workers, and sugar refiners; analine fumes in analine factories and dyers; arsenic and mercury by taxidermists tanning and finishing felt; extracting oil from raw wool, glass workers; coloring wall paper and artificial flowers and textiles in the preparation of bronze colors among painters and seamstresses; producing artificial stone and zinc, smelters; benzine fumes in analine factories and finishing cloth; lead by lead smelters, lead miners, lead factories, printers, typesetters, brush makers, enamels workers, glass, gold, silver, patent leather workers, painters, tailors, seamstresses, seamen, lace makers, wall paper workers, potters, gilders, lead platers in sulphite and cellulose factories, and weavers; carbolic acid in paraffine factories; hydrochloric and nitric acid fumes in chemical works, damask workers, and tin plate workers; chromatic acid, yellow chromate of potassium in the preparation of chromatic salts; hydrocyanic acid fumes in Prussian blue factories in the production of fulminate of mercury, in galvanic gold and silver plating, and among photographers; iodine in chemical factories; carbon monoxide gas worsted spinners; illuminating gas factories, hydrogen gas factories, foundries; carbon dioxide in compressed air workers, glue and paper factories; copper among bronzes, coppersmiths, filers, founders and watch makers; methyl alcohol fumes among silk operators, felt hats and furniture lacquer; nitro benzol in analine factories; sulphuric acid fumes among bleachers of straw, bristles, hops, and wool in paper manufacturing; bisulphide of carbon among india rubber workers; turpentine fumes among painters, varnishes and match workers. The above is taken from Eulenburg's Encyclopedia, and based on so eminent an authority, should be of very material value. He has dealt very exhaustively with the different phases of the above separately, but space would not permit of their reproduction in this report. The necessity of pure air in workrooms is among the first of the indispensable necessities of man. The hygienic investigations of the past few years and especially under the complicated conditions of overcrowded cities weighed down with all sorts of disease and illness have shown the great importance of pure air and its far-reaching influence upon humanity. The extent of this influence depends not only upon the quantity but also upon the composition of the air, and the manner in which it is led into dwellings and factories. The beneficent influences of good air have been shown with the greatest exactness. Its harmful contents have been proved without the slightest doubt, and we know how the latter exert their injurious influences on the various organs of the body as well as upon a great part of our industrial activities. Science has spoken loudly and insistently in this respect, yet proportionately little has been done to bring about better conditions from a hygienic standpoint. Numbers even of those who otherwise watch over their health with timidity expose themselves carelessly to the influence of poison-impregnated air. In most of our populous cities an active and fearless fight is carried on against epidemics. local diseases and a whole series of pulmonary ills whose cause might be traced primarily to the poor condition of the air and its defective distribution. Statistics give ample proof of the dangers to which we are in a state of childish innocence. They further prove that the improvement of the air in factory sanitation is one of the most pressing demands of private and public life. In most factories the air is used as it is found in the rooms. It is evident that air exposed to various influences can and must take up substances that can produce manifold ills in the human organism. The air is one of those substances that must always be suspected. This is most advisable

in large centres of population, because of the conditions peculiar to them. Would it not be remarkable if the inhalation for a period of many years of air filled with pernicious substances had not a far-reaching detrimental influence on the population, and in particular the factory workers. Would it not be just as wonderful if it did not induce a susceptibility to disease and exert an intrinsic influence upon the generation and spread of disease and epidemics. Although the most recognized authorities in natural science have frequently insisted upon and pointed out the detrimental influences of infected air, yet at the present time unfortunately a very exact knowledge as to the kind, degree, and certainly very harmful results of these influences is lacking. As already indicated, this work is as difficult as it is necessary, because of the never absent coincidence of other harmful influences which make it almost impossible to separate a single one with satisfactory exactness. Lately, thanks to the laborious researches of scientists, certain fundamental rules have been established. This was done largely in England and other European countries, where the poverty of great masses and the consequent epidemics in densely populated manufacturing centres made exact investigations of the public conditions of health necessary. We endeavor to purify the contaminated air in closed rooms by the introduction of external air. The supply of fresh air is drawn from the great ocean of air contaminated at various places and in various degrees. The impurities are divided into two classes those absolutely harmful, and those which become harmful on account of a certain degree of intensity. The first includes the germs of contagious diseases which are dangerous in large or small quantities. Such impurities are characterized as living organisms and possess the power of propagation. The second are the gases of putrefaction, such as carbonic acid gas, ammonia and aqueous vapors. These latter do not always appear in harmful quantities, but prepare the inroads for other diseases. Among the disturbing influences of city air are particles of soot and ashes, sulphuric, sulphurous and hydrochloric acids all of which are the products of combustion. In Manchester upon a space of one square mile, 1,455 pounds of soot, 110 pounds of sulphuric acid, and 55 pounds of hydrochloric acid have been found to fall in three days. According to statistics 6,500,000 tons of coal are consumed annually in the city of London, England, producing 195,720 tons of sulphuric acid. Not only plants and trees suffer from the effects of this smoke, but consumptives, asthmatics, and all persons with weak lungs. Mechanical dust, although consisting of harmless material, works disaster by irritating the lungs. Air is always most impure close to the places where those impurities arise; therefore, such places should be avoided as bases of supply. Close over the surface of the earth, without doubt, the products of decomposition of organic matter is most to be feared. Of course, in cities, such organic matter depends largely on the nature of the pavements. There are three possibilities for source of supply. First, in general, supplies of air taken from over good clean pavements contain a small percentage of the gases of putrefaction, and, on the whole, air taken close to the surface of the ground will compare favorably with any other source, providing, however that especially unfavorable locations are avoided. Secondly, at some distance, say 25 to 40 feet above the ground, the composition of the air depends largely upon spontaneous ventilation of the buildings, especially where the interchange is produced by means of air pressure, the vitiated air escapes through the pores of the building instead of above and thus is likely to cause an extensive contamination of the external air. This contamination depends on definite conditions. Therefore, in the consideration of a source of supply, it should not be considered absolutely unreliable. The third source of supply is the

roof. This also has its objections, especially in cities where the diffusion of the impure air takes place above the roof. Since all new air must finally come from this place. This source is in the closest proximity to the chimney openings, which just as often belch forth smoke to either side, or even downward, as upward. In fact, the whole roof space is a deposit of soot and dust, and the combustion gases are carried in great quantities dangerously near the source of supply. Like smoke, the vitiated air is as a rule expelled over the roof. Usually closets and sewers have ventilation openings on the roof. Of course, these gases also diffuse among the lower layers of air but are then very much rarefied. Consequently, there are reasons for and against this source of supply. In fact there is no decisive reason for the adoption of any one of these three locations. The choice may be rather in consideration of the wind pressure upon the ventilation plant. The pressure of wind would affect those openings at some height from the ground more than those protected by walls, trees, etc. The choice for a source of supply should therefore be governed by local conditions. It would seem one of the most urgent duties of sanitary science to treat the purification of air and its conduction to factories and public institutions with the same care as has already been devoted to water for many years.

Illumination of Factories.

Investigations in regard to the illumination of factories are frequently difficult, because no definite standards have been set up. One branch of industry may require more light than another. From an official point of view definite specifications can only be satisfactorily made in the case of new constructions or extensive alterations. In the investigation of factories in respect to natural illumination the following fundamental principles should be observed. The amount of light should be reckoned according to the proportion between the area of the wall and the area of the windows. This method has the advantage of simplicity over all others bceause we have the above factors always before us. The area of the windows should occupy about one-third of the wall area. A hygienic authority, Popper, demands one square yard of window area for every 30 cubic yards of space. In my opinion, the experience and the nature of the work is the most reliable basis as to the proper lighting of workrooms. However, the necessity of considering the merits and demerits of gas versus electricity in producing artificial light from a hygienic standpoint should not be overlooked. It is a well-known fact that electric light from a scientific standpoint is preferable to all other methods. Besides its excellent effects in that it comes nearest to natural sunlight, it has the following advantages: It does not raise the temperature of the room in which it burns, and it does not vitiate the air, because no carbon dioxide is produced. Of course, much could be said for and against any method of lighting, but, as before indicated, electricity both for light and as a means for transmitting power has much to commend it.

Injurious Influences of Temperature in Workrooms.

The temperature that causes trouble in factories is more often heat than cold. Sources of heat are frequently found in factories which should be considered very carefully, and which have nothing whatever to do with heating the rooms. This is especially true when we consider the high temperature to which men are exposed in the different trades, such as moulding, stoking, hat-making, the steam processes, dyeing, paper manufacturing, etc., the last named occupation being even more extreme than others because of the hum-

idity. Working rooms in which the temperature is very much increased, not only by steam or hot pipes, but by gas or petroleum jets or fires, should be provided with a good system of ventilation. All measures which limit the constructive liberty of the owner for the sake of general good and the preservation of the general health of workmen in factories which are about to be constructed serve in a special manner towards reaching the sanitary ends indicated. In respect to those factories already constructed such measures should be adopted as will anticipate or remove the danger that already surrounds the workman and threatens the general public.

Cement Construction of Factories.

A new condition is presented of late years in the construction of factories of cement materials. As this is most commendable from a sanitary point of view as regards its non-porous qualities, it would be well to always keep in view that buildings constructed of any non-absorbent materials should be so constructed with a special view as to good ventilation. In fact, it should be so constructed or provided with artificial means that will at all times control the humidity of the atmosphere in the rooms, keepng the walls, floors, and ceilings free from dampness. The importance of this may be judged by the number of factories that are likely to be constructed of this material in the near future, caused no doubt by the comparative cheapness of such materials as wood, brick, or stone, as well as their resistance to fire and other special advantages. The floors of such factories, if constructed of cement, should be supplemented with wood or slat platforms for workmen to stand on, so as to provide that elasticity so essential to workmen who are obliged to labor in a standing position. This latter suggestion applies to cement floors in all factories.

Good Sewerage an Important Factor in Good Sanitation.

Each year's report of the Inspectors of Factories presents some developments in nearly every detail of factory construction, safety, ventilation, and sanitary requirements. Of these, none is more important than a good system of sewerage. This question has been a most difficult one to cope with, partly because of certain conditions surrounding the location of some factories, and largely because in many smaller towns and places no definite system of sewerage has been established. A paper read by Mr. M. J. Quinn, Provincial Mechanical Superintendent, before the Medical Health Officers at Sarnia on July 14th, 1904, entitled "A Perfect Sewerage System for Rural Homes, Schools and Factories," should be of interest to all whose conditional surroundings would make a local system absolutely necessary and advantageous. This would apply to all places where a definite municipal system of sewerage was not contemplated or adopted. I will draw your attention to the observations contained in the third paragraph of Mr. Quinn's paper, which are quite significant, and are as follows: "In the matter of public sanitation, the question of disposing of sewage in small towns and villages, as well as less populated districts where by reason of its great cost a general system of sewerage is impossible, is daily becoming of great importance, and as the title of my paper would indicate, that is the phase of the question with which I propose to deal. The system to which I intend to refer is known as the septic tank system, and I believe that nearly all who have studied it are agreed that it is at once the most natural, most scientific, simple, and economic system in use to-day, and speaking from a personal knowledge of scores of systems, I am in a position to say that it is worthy of all the good things

that are said of it." To do justice to Mr. Quinn's paper and the system he so strongly recommends, his paper and explanations should be studied in detail in the annual report of the Provincial Board of Health.

Accidents.

Appended herewith is a list of the accidents which happened in my district as reported to me. The increased number of accidents reported each year might indicate that factories were not as well protected as in former years. This, however, is not the case. Each year adds to the general equipment and measures of safety provided in factories. The large list of casualties is due to the better observance of the law in reporting accidents and no doubt to some extent to the increased industrial activity. In an excellent paper prepared and read by Mr. Louis Guyon, Chief Factory Inspector for the Province of Quebec, before the International Association of Factory Inspectors on August 25th, 1903, at Montreal, he remarked: "In taking up the subject of methods of prevention, it is not my purpose to tax your patience by a long enumeration of technical appliances or their respective merits or degree of originality in preventing casualties in factories. I simply ask your kind attention while I endeavor to show what progress has been made in the adoption of preventive measures in the different countries of Europe since the first Accident Convention, which I had the honor to attend in Paris in 1889. In 1886, statistics in Germany showed that one hundred thousand accidents had taken place in industrial establishments during the year. This serious matter could not fail to attract general attention inasmuch as the obligatory state insurance law had just been inaugurated. It was but natural that the German Government would turn its attention to preventive measures in order to lighten the burden on the State. In 1888 a successful exhibition was organized in Berlin under the distinguished patronage of the Emperor, over thirteen hundred exhibitors sending models of different kinds. In the meanwhile several societies for the prevention of accidents had been organized in France and the opening of the World's Fair in 1889 coincided with the foundation of an International Congress on Accidents with a membership of seven hundred. The great importance and enduring quality of the work accomplished by this organization may be appreciated when it is known that during the last fourteen years the International Congress has left its stamp on all the Factory Acts enacted in Europe. Ten years later the theories of 1889 have taken concrete form. Under the pressure of insurance laws and compensation Acts, preventive appliances are being rapidly introduced. Private initiative rivalling with legislative power for the better protection of the long neglected toilers. In ten years' time the manufacturers of Europe had become convinced that accidents could be prevented to a vry large extent. It was simply a question of education. Measures of preventive appliances had been created in different countries. In the Department of Social Economy of the Paris Exhibition could be seen collections of numerous safety devices of all kinds. A permanent museum in Amsterdam. The Manufacturers' Association of France exhibited a complete collection of appliances adapted to machines. The German exhibit was also very remarkable. After fifteen years spent at the work of inspection in our Province, I am thoroughly convinced of this fact that amidst the variety of dangers which attend employees in mills and factories, none occupy so prominent a position as those arising from machinery worked by mechanical power. Other accidents, such as disastrous fires and explosions, may, from time to time, attract public attention more vividly, but we only have to refer to

statistics to perceive how recurrent are the risks incurred by factory workers from machinery. In England during the year 1899, there occurred 301 fatal accidents and 19,321 non-fatal attributable to machinery and all this under an admirable system of factory inspection. Factory inspection, no doubt, offers a very substantial guarantee, but it is undeniable that private initiative when well directed can work wonders in the prevention of accidents. Factory legislation has a tendency to generalize. It cannot enter into all the details, and in most cases it only requires the minimum measures of safety. It is necessary that it should be conceived on very broad lines in order that the essential principles of industrial freedom may be guaranteed. On private initiative devolves the task of introducing appliances for the prevention of accidents. The question arises: Will employers living in different Provinces where compensation to injured workmen is regulated by common law, and where the theory of a professional risk does not yet form part of the jurisprudence of the country, assume the onerous task of equipping their factories with the best appliances known? I have given this matter very serious study, and I am convinced that every Inspector here has a duty to perform in this connection. The great improvements that have taken place in Europe in the better equipment of factories give every indication that ever increasing industrial activity will henceforth be coupled to a greater respect for human lives. Some manufacturers are, of course, hard to convince. They will display a great alacrity in putting in automatic sprinklers or fire-fighting appliances of all kinds. They are willing to submit to the most arbitrary order of a board of underwriters, yet when told to put on saw guards or other special devices, they will argue with the Inspector, and only comply when threatened with an action, thus placing more value on property than human lives. It is interesting to know, however, that in Europe, manufacturers have been won over to principles of prevention. France has an Association numbering 2,700 manufacturers extending protection over 300,000 workingmen. The same exists in Austria, Germany, and Italy."

The preparation of a supplement to this report, illustrating various methods of protecting machinery and thereby assisting workmen in protecting themselves from accident, is now under consideration.

Respectfully submitted,

THOMAS KEILTY,
Factories Inspector.

REPORT OF INSPECTOR ARTHUR W. HOLMES.

To the Honorable Minister of Agriculture:

SIR,—I have the honor to submit a report of the inspection of factories and workshops in my district for the year just closed.

CANNING INDUSTRIES.

My district of inspection in regard to canning factories differs very much from that of any of the other inspectors, so far as the help problem is concerned. Very little native help is employed, depending largely on the foreign help imported for the season's work, consisting mainly of Polocks, Italians and Swedes from across the border, with a small sprinkling of native Indians The wages paid for the work seem to be fairly satisfactory, most of it being on the piece work system. The wages run from six to twelve dollars per week of sixty hours, varying according to the speed and diligence of the worker. The season extends from three to six months. A number of these girls have returned to their homes in Buffalo and Lockport with two hundred dollars, their savings for the season. I would like to see some attempt made to have that wealth remain in Canada. It would not require much of an effort to keep it among the people. There are large numbers in the cities and towns who would be pleased to have an opportunity to make fair wages and have an outing in the country at the same time. It would be a change which would be beneficial to everyone, as a great number of factories are in the midst of the fruit-growing country. It would require some systematic movement whereby the workers and the employing canners could be brought together. Something along the line of an employment agency under the supervision of the Government would fit the requirements of the case. A large number of people could be given work and the money kept in the Province. I am pleased to report that the conditions in the factories are somewhat improved. One new factory which has been built within the year is a great improvement over the majority of them. The cooking and process room is entirely separate from the other portion of the plant. It makes the conditions better for those employed in preparing the fruit, as no steam enters the room where they work. Some ventilating fans are in use for removing steam, which give very good results When the cooking room is underneath the other rooms, the floors are damp and the air muggy. We are trying to have these things improved. The living and housing conditions of the help, I regret to say, have been very little improved. Cooking, eating and sleeping in one room is not conducive to cleanliness. Overcrowding exists to some extent. In one case that came under my notice, sixteen females slept in a room ten feet by sixteen. One recommendation which I have made is to have some one appointed whose sole duties would be to look after the house, prepare meals, make and keep beds clean and have the rooms aired, the general supervision of the house, and I believe there will be but little improvement until it is carried out. Under the conditions existing at present, it is no person's duty. They get up in the morning at 6 o'clock ready to go to work at 7. The windows and doors are fastened down tight to keep stragglers out, a rush is made for dinner, when the doors are locked again. They may work until 9 o'clock at night, and tired out in body, they lie down to rest and recruit for another day, the bed in the same condition as when they arose. It is impossible under these conditions to have any fresh air enter the rooms or have personal cleanliness prevail among the help. In some places our suggestions made last year in regard to a plentiful supply of soap and towels have been carried out. It has been ignored by a few, but we have insisted that it be lived up to. I find the disposal of refuse matter

much improved this season. Decayed vegetable matter is both obnoxious and injurious. The closet accommodation is not what it might be. No one seems to have any supervision over them, and I found some of them in a filthy state When the attention of the employer or manager was called to it, one excuse offered was the filthy habits of the help employed; another that he could get no person to clean them. I visited several of the places the second time to see that the instructions were carried out. The section relating to the employment of children is very much abused in some of the factories, while some would not have a child of any kind around the place. I see no reason why any exemption should be given. The work is laborious and steady; if they do not apply themselves faithfully, they are not wanted. I have seen them, from the child in the perambulator, kept there while the mother toiled her ten or twelve hours. Whenever I have found these extreme cases I have made inquiries as to the necessity of such, and have yet to find a case that could be in any way justified. A great amount of the child labor in canning factories is imported. The mother comes over here for a few months, and brings with her the family of children, and, if they are able to work, it is there for them.

Food products of all kinds should be put up under the very best and cleanest conditions that are possible. Canning factories of all kinds, mince meat and porkpacking plants, and where sausages are made, come within this scope.

CHILD LABOR.

Much can be said and written on this subject, but nothing very new. I have devoted some attention to it, and have had in the close proximity of one hundred certificates of birth examined and verified in the Registrar-General's Department. In some cases on account of non-registration or foreign birth, it is impossible to get any record. The inspector is powerless to prevent the child from continuing at work. In this respect I would recommend, as I have done in my previous report, that a certificate from the teacher of the school, which children have attended, should be required as to their age before boys or girls are allowed to work in a factory, as there is no temptation at that time to give a false age. It would greatly strengthen the Inspector's position. I have had a few cases of false certificates in regard to age. In the majority of cases, the reason given was: ignorant of any harm to come from it, or a widowed mother left with a large family to provide for, and anxious that her child should give her a helping hand. While I did not prosecute the parents I had the children removed from the factory until they were the proper legal age. Some school teachers and inspectors seem to have the opinion that they have the power to grant permission to children under the age of fourteen to work in a factory, as I have had two cases this year where such permits were granted. While they may have the authority to allow them to absent themselves from school, I am not aware of any clause in the Act which gives them that privilege, and I wrote them to that effect. In my district there are two places which employ a large number of boys, where the wages are about six dollars a week. The boys and their parents are anxious that they remain at work as the remuneration is fairly good. When under age and informed that there were no law to prevent them working in places other than factories, they were very loth to leave, and in some cases were prepared to sign false certificates as referred to above. There are places where boys should not be allowed to work at any age, such as, where acids are used for dipping, tinning and such like, polishing and buffing rooms, and wall paper factories, where the extreme heat combined with the fumes from the coloring matter used, would physically unfit him for the struggle in after years. The Shops Act calls for an age limit of ten years. In my opinion, this is far too young for children to go out into the world and fight the battle of life. If we expect to build up a strong nation, both physically and mentally, it can-

not be done by sacrificing our children to the greed of commercialism. It should be amended so as to make it the same as the Factories Act, which is fourteen years.

Boiler Inspection.

In regard to boiler inspection I can only emphasize what I have said before on this subject, that all boilers should come under the provisions of the Factories Act. A boiler where only four are employed is in need of inspection just as often as those in the larger plants. Very often they are in charge of a boy or some one who is entirely ignorant of the power of steam. I have found a large percentage of the boilers insured with the boiler insurance companies authorized by the Province for that purpose. By this means they get examined three or four times a year by an outside practical engineer. I have succeeded in getting a large number of reports from those who do not carry boiler insurance. I have had a few complaints regarding boilers being unsafe, and at once investigated and asked for a report as to their condition. It should be made compulsory that all users of steam boilers send into the Department, each year, a report on the condition of the boiler, including those made by the boiler insurance companies.

Machinery.

One portion of the Factories Act that hardly any opposition is raised to is the guarding of machinery. Employers will some time remark that the machine has been in that condition for the last twenty years or so, and no one hurt, but if the danger is pointed out they will remedy it. One place I visited which did not come under the Act (less than five being employed), a small spur gear was running about six inches from the floor. I suggested to the young man in charge that it should be covered, as some one was liable to have their overalls caught or something drop into the gear. He answered me by saying, no doubt it would be attended to shortly, as the employer had got caught in it three days previous, and was at home nursing his injuries. I have notified every place visited operating a buzz planer, shaper, or saw, to provide suitable guards for the same. I met a number of employers who claim their employees will not use them, and was asked what could be done in cases of that kind. There are a great many other factory rules of less importance in which a certain amount of discipline is used to have them carried into effect. The use of guards could form one of them. If some standard guard was adopted for all these machines mentioned, it would simplify matters very much. The projecting set-screws are another source of great danger. Now that a safety headless set-screw is on the market which will meet all the requirements, they should come into universal use on all moving machinery. I have at all times asked that they either be guarded or replaced by safeties. A great many machines have no belt shifters. The belt being shifted with a stick, bar of iron, the hand or foot. It is a source of danger, no matter how expert the operator may be.

Ventilation.

I have devoted considerable time and attention to those places where polishing and buffing wheels are used, with a fair amount of success. A large number of the old established factories have had exhaust fan and pipes installed for a number of years, but have allowed them to become useless by neglect and abuse. Some of the employers also complain that those for whose benefit they were placed refuse to use them. In some cases I have found that it is more the fault of the plant not being properly placed, or the construction of the pipes not being suitable for the duty expected of them, poor hoods, or allowing the pipes to fill up, and thereby making them practically useless for the purpose of removing dust. I have served notice on all those that required repairing. Some of the factories where this work is carried on are entirely free from dust, while others

are unhealthy for the operators, and also for a number of the other employees in the factory. Moulding shops could be very much improved by the installation of ventilating fans, as the gases and fumes arising from the molten metal poured into the moulds during the hours of casting are both obnoxious and injurious to health. A great deal depends on the state of the atmosphere outside. If it is damp and muggy very little goes out through the ventilators. It requires some artificial assistance, such as a current of air from the fans to drive it upward and force it out. Some shops that are heated by the hot air system have had good results by turning the hot air off and using the fan and pipes to circulate cold air through the shop during pouring off time.

Laundries.

Work in a laundry is of a very exacting nature. The different changes in temperature, inhaling of steam, damp floors and lack of ventilation are a great tax on the system, and only those who are rugged in health can stand the life very long. For this reason help is sometimes difficult to obtain. In some of the laundries built lately a wonderful improvement is noticeable, and everything has been done to better the conditions and make life a little more comfortable for the worker. In one factory in Toronto no expense has been spared to make it up to date in every particular.

Bake Shops.

I am pleased to report that the law relating to bake shops in the outside towns and villages is fairly well carried out. In the cities the only complaint received was regarding Sunday labor. I visited both firms complained of and pointed out the law covering such cases, and they promised to observe it in the future.

Over-time.

The law relating to permits for over-time in my opinion could be very much improved by reducing the time limit.

Section 11 (b) of the Act states: "The hours of labour for women, young girls and children shall not be more than twelve and a half in any one day, nor more than seventy-two and a half in any one week, and

"(c) Such exemption shall not comprise more than thirty-six days, in the whole, in any twelve months; and in reckoning such period of thirty-six days, every day on which any child, young girl, or woman has been employed over-time shall be taken into account."

It practically means that young girls and women can be compelled to work three nights a week for three months. Ten hours a day, week in and week out, is plenty long enough for any one to work, especially those in workshops and factories where machines are speeded to the highest tension possible. I do not believe it is carried on to as great an extent as formerly, as a large portion of employers realize that when an employee has given sixty hours of service a week, that is all that should be required. They are a few, however, both employers and employees, who do not feel satisfied unless a certain amount is worked. In this mechanical age where the means of production have increased a hundred fold, it should be possible to shorten the over-time or eliminate it altogether.

Fire-escapes.

One of the most important features of the Factories Act is that relating to fire-escapes. More attention has been given to this matter by those who have erected new factories by providing fire walls and tower stairways. These are preferable to the outside iron balcony fire-escape, as in a number of instances I have found the door or window leading thereto blocked by lumber, machinery or other material. In winter, they are also liable to be covered with snow and ice making it impossible for any one to use it as a means of escape. I have at all times requested that they be kept clear of obstructions.

New Factories.

It is a pleasure to be able to say that the state of trade throughout the country is very good. The best evidence is the large number of new factories being built. A great deal of time and attention has been devoted in making them pleasant and healthful for the employees. Plenty of good natural light, good drainage, first class lavatories, wash rooms, lunch rooms, machinery well guarded, ventilating fans, etc. Some of them I visited are models of comfort and cleanliness and what the workers are fully entitled to. I believe it will pay large returns to the employers. Under good conditions, the earning power of the wage-earner is increased with far less tax on the worker. Very few of the owners seem to be aware of the law in regard to new factories commencing. The following is section 51 of the Act: "The owner, proprietor, or manager of any factory hereafter established and to which this Act applies, shall not begin operations until he shall have received from the Factories Inspector a certificate of inspection of the factory and a permit to operate the same; and any such person violating the provisions of this section shall be liable to the penalties provided for in section 19 of this Act." That may be accounted for by the large number who have come over from across the line to locate here.

The day is passing by in this Province when the inspector is met with a frown. The employer realizes the needs of his visit, and in most cases is pleased to have his opinions as to reforms to be carried out. He recognizes that it may mean much possible litigation avoided, the minimum of accidents or probably the saving of human life, and that under good conditions their employees can turn out better and more effective work.

Convention.

The nineteenth annual convention of Factory Inspectors of North America was held in the city of Detroit in the middle of August last, which I was privileged to attend. Quite a number of interesting and instructive papers were read and discussed, the majority of them dealing with the child labor problem. About sixty delegates were in attendance from all parts of the United States and Canada.

Elevators.

The clause in the act relating to elevators and hoists is a fairly good one. No matter what the law is, nor how the inspectors try to have it carried out, there will always be some who are willing to take any and all chances in operating elevators. I have gone into some places and found the trap-doors on every flat fastened up with nails, and they had been in that position for weeks. Another case was where the lifting bar had become bent and was taken off for repairs, and not replaced. When it was pointed out to the employer, he gave orders to have it placed in position at once. Some of those who build and instal new elevators are also to blame for placing in a factory gates which do not comply with the Factories Act, of which they must be fully aware. They might well be right in the first place and save friction all round. The factory owner naturally expects that it will comply with the provisions of the law and pass inspection. There have been a large number of accidents resulting from elevators, some of them being caused through carelessness. When the elevator is operated by one person only the danger is somewhat lessened. The operator is held responsible to some extent for having gates properly closed, and is more apt to detect any part of the hoist or cables in need of repair.

A list of accidents reported during the year is appended herewith.

All of which I have the honor to submit.

Yours most respectfully,

Arthur W. Holmes,

Inspector of Factories.

REPORT OF INSPECTOR JOHN ARGUE.

To the Honorable the Minister of Agriculture:

SIR:—I have the honor to submit the following report of my inspection of factories for the year 1905.

I accepted the appointment of Inspector of Factories for the Province of Ontario last April under a very keen sense of the grave responsibilities attaching to that office, and firmly resolved to perform its duties to the very best of my ability, without fear or favor. As I take it this office is of extreme practical importance; and has been called into existence, not in the interest of its incumbents, but in that of the whole community, of the employers of labor, and pre-eminently of the employed. We live in an age of wonderous industrial activities, an age of hustle and bustle, of greed and speed, of complicated and ever changing machinery, often worked to its utmost capacity, and that sometimes by unskilled hands; an age, therefore, of unusual danger to life and limb, on a continent more noted for material enterprise and progress than for its belief in the sacredness of human life It is a dark fact in our Anglo-Saxon civilization that Canada, England, and especially the United States, are far behind the other civilized nations in their protection of the operator in all lines of manufacturing and commercial activity. The Factories Act was the first step in our redemption from a position so little to our credit; and, a firm execution of that Act should command the sympathy and support of all classes, not excepting employers themselves. And, indeed, I find that this is generally the case. As a rule the employer of labor, at any rate in my district, does not feel himself in an attitude of hostility to the Inspector as an unavoidable evil. Far otherwise. Wherever my duties called me I was invariably treated with courtesy, respect and even cordiality. My suggestions as to necessary advances and alterations have met with no rebuffs. On the contrary, I witnessed on all hands a manifest desire on the part of employers to act on these suggestions, and to aid in the strictest observance of the law; a condition of things much more agreeable to all concerned, and ultimately more productive of good results than would be an opposite state of affairs. I prefer suasion to force. Things done cheerfully are done best. Nevertheless, where suggestion fails, or gentle admonition is disregarded, I shall not shrink from having recourse to sterner measures, as provided in the Factories Act. I need hardly add, however, that my experience so far would not lead me to anticipate much trouble of this nature. In any case, the Act must operate to the full. It was too long needed, and is too much needed, to be treated in any particular as a dead letter. Indeed in my opinion it does'nót reach far enough. True, the amendments of 1904 have done much to remove this objection, but more remains to be done. For instance, take the question of machinery.

MACHINERY.

Notwithstanding all that Ontario legislation has done in the way of guarding against accidents from dangerous machinery, we are still behind Quebec in this great matter, and a long way behind England, even as she is behind Europe. Compelling the *owner* of a machine to affix the proper danger guards is all very well so far as it goes, but would it not be far better to compel its maker to do it? In England and on the Continent the manufacturer attaches the guard. No dangerous piece of mechanism can leave the shop without it. The guard is treated as part of the machine, and is not left to the purchaser to construct and set in place, perchance to the increase of danger, not its abatement or extinction. In this way the country knows that a guard is a guard. We leave too much to chance Where life or limb is at stake, no preventable

touch of hap-hazard should ever find a place. In large factories, the wild whir of complex machinery in all corners tells of danger or death when each deadly part is grinding or whirling fiercely, bare or inefficently fenced, and no man knows how to fence it as does the man who made it. Perfect protection, so far as perfect protection is possible, means machine and guards considered as one and indivisible, all completed in the maker's shop antecedent to sale. Any further amendment to the Act should embody this provision. The manufacturer may "kick," but the public would be spared the pain of reading that awful list appended to our yearly report. Not that accidents would cease to happen, for no amount of legislative wisdom can save from folly and carelessness, but at least the sad long list would be greatly shortened. As a rule the shops and factories inspected by me come fairly well up to the requirements of the law, and yet it would not be true to say that the risks therein are at a minimum. This will not be, so long as an uncovered belt or rod can catch a coat-tail, or a saw snatch off unwary fingers. The operators are in constant danger, and so is the visitor who drops in to see things. In one word, I contend that every bit of machinery from which it is possible for harm to issue to any human being whomsoever, should be clad, fenced off, guarded or covered up so as to render all risk of injury from contact with it all but absolutely impossible

Boilers.

There is another matter, which, I think demands the attention of the Legislature, and that is the question of boilers.

Boilers are dangerous things. To have charge of a boiler is to stand in a place of awful responsibility. It is a post no novice or inexperienced person should ever be allowed to occupy. Nay, I think that more than mere experience is wanted. The stationary engineer, wherever steam is employed, should have a professional training, and should hold a certificate from a Board of examiners appointed by Government There have been in Canada, from time to time, scores of boiler explosions, the direct result of the ignorance and recklessness of those in charge. These dire happenings are not "accidents"; they are crimes. Nor is that country guiltless which calmly or indifferently acquiesces in them, as pitiable calamities, unforeseenable and unpreventable. They are just what we may expect with incompetence at the helm. Legislation seems needed here. And it should cover and include *all* places where steam is used; for wherever it is used, there is always more or less risk of explosion, or damage from it. In British Columbia all boilers in use are inspected by a Government Inspector. In that Province, too, no new boiler can be built apart for the supervision of the Government Inspector, whose duty it is to see that the materials used in its construction are the very best that can be procured. All this is as it should be, and as I hope it soon will be in Ontario. Incompetent, careless, or inexperienced persons should not have charge of boilers, steam engines, electric plants, or any device or machine whatever, the mishandling of which may imperil their own or other people's lives. And these remarks I make in a general way and from a sense of the transcendent importance of the subject rather than as arising out of any shortcomings noticed by me as to the fulfilment of the requirements of the Factories Act, or of the accidents caused thereby. The great matter for surprise is that explosions are not more frequent than they are; as the smaller businesses are sometimes represented as not able to bear the cost on insurance in boiler inspection companies, or the salaries of certificated engineers. Nevertheless, all boilers should be in charge of competent men and subject to authorized inspectoral supervision.

Another matter that seems to demand legislation is the very objectionable and dangerous practice of suddenly and without warning stopping and re-start-

ing machinery; or connecting it with the motive power without due notice to all concerned. I am not in a position to say that this practice prevails to any great extent in the district I have inspected; but it is a practice not unknown in factories; and wherever it occurs, were it but once in ten years, it occurs just once too often. The law should make due warning obligatory in all such cases.

ELEVATORS.

This hurried rushing age demands elevators in all hives of industry or trade; they are simply indispensable. Yet they are dangerous. The amended Factories Act as to these, approaches completeness, yet I think it lacks the main point, namely, daily inspection. There ought to be in every city, town, or village where elevators are in use, one or more elevator inspectors, whose duty it would be to make a minute and careful examination at least once in every twenty-four hours, and report to the proper authorities. Minute legislative provisions as to gear, guards, gates, etc. are one thing, their daily liberal execution is another thing altogether. The Factory Inspectors visits are too few and far between to insure continuous safety. In my opinion nothing short of a *daily inspection* will accomplish this. And every elevator in the land should be subject to this inspection.

FIRE-ESCAPES.

I presume my district is no worse provided with these than any other district; and yet this serious business is far from being in an ideal condition; In fact the ideal escape is yet in the womb of the future. The inventions and appliances hitherto reached, seem amazingly crude and ineffective in practice, in an age pre-eminently above all other ages for inventive ingenuity. Can it be that there is less money in life-saving than in labor-saving? No; I believe the true fire-escape is on its way to us, bearing a fortune to its inventor, and the blessings of the race. Except the livid spectacle of a fire in mid-ocean, what sight on earth more awful than that of some many storied building alive with helpless human beings and roaring with flames? Legislatures here are nearly powerless. We must invoke the gospel of love and the fire of inventive genius.

SANITATION.

Inasmuch as the great majority of the factories in the district assigned to me this year are saw-mills, planing mills, etc., and that my inspections have been principally made during the warm summer months, when ventilation by open doors and windows takes place as a matter of course, I do not propose to dwell on this part of the subject in my present report. And for another reason which is this: Ventilation has been so amply ventilated already in the Inspector'o Reports, that it is next to impossible to say anything new on the subject And the same remarks will apply to lavatories, water-closets, and sanitation in all its branches. I have made a very searching examination into all these matters, and have found things in general fairly satisfactory, as these things generally go, but with room for improvement in too many instances. Many small towns and villages are entirely without sewerage, the basis of any comprehensive and effective system of sanitation I have dwelt in this report, mainly on the dangers to life and limb incident to factory operations, not that I undervalue the sanitarial provisions of the factory laws. By no means They are of vital importance. Their neglect means death too, though of slower approach. Neither man nor beast can live or thrive on foul air, or in germ-infested rooms. The open door and window in summer, and the fan blower in winter, fill the bill in a sort of rough and ready way; but only so. More is needed before perfection is reached. To my mind the one ideal ventilator is the open fire place on the floor level. Our first settlers breathed an air in their humble homes far

purer than that breathed to-day by their more pretentious grandchildren. The foul gases were burnt, or whisked up the chimney. No headaches in those days. The headaches and the stoves made their advent together.

CHILDREN.

Nor have I had much to say on the question of children under age working in factories There are hardly any such in this district; but then there ought to be none at all. I have impressed this fact to the best of my power on the minds of employers, who seem to approve of the law, and desire to observe it strictly in this very serious matter; very serious because robbing the child of all school chances, and thus maiming him for life worse than does the erratic circular saw its incautious victim. Indeed, from my interviews with employers on this subject, I am satisfied that the presence of under-age children in their factories is not really due to motives of economy but to good nature—to an inability to resist the pleadings of the poor or the tears of desolate widowhood. I believe, therefore, that a strict enforcement of the Act as regards this matter, so far from being resented by these men as hostile to their wishes and interests, would be actually welcomed by them as a refuge and relief.

I may add that this district extends from Ottawa on the east to Kenora on the west, and from Orillia to Cobalt, taking in New Liskeard, Rainy River, and parts of the old North-western Ontario

A list of accidents reported during the year as occurring in the North-western district is herewith appended.

All of which is respectfully submitted.

I have the honor to be
Sir,
Your obedient servant,

JOHN ARGUE.
Inspector of Factories.

REPORT OF MISS MARGARET CARLYLE.

To the Honorable the Minister of Agriculture:

SIR,—I have the honor to submit a report of the work of inspection of factories, workshops, and mercantile establishments in the Western part of Ontario for the year 1905.

The ground covered has been much the same as last year. We have nothing to record but marked progress in the improvement of conditions. I believe that both the spirit and the letter of the law are, generally speaking, observed with but few exceptions, and the suggestions made were cheerfully and promptly complied with. It is not necessary to enter into any comment as to the necessity and value of factory inspection.

I spent more time in Toronto in 1905 than in former years owing to the large number of new industries being erected and occupied on account of the large fire the previous year. Many special visits to factories have been made in response to written requests, and almost every visit now occupies much longer time than formerly, on account of the increasing number of fresh points requiring special attention. The work is much more in hand than was the case in former years. This improvement I think is mainly due to the fact that employers are much better acquainted with the law, and we find that the instructions given have been, generally speaking, carried out.

The Province of Ontario has enjoyed another year of prosperity. Industrih activity has been well maintained, and a good many of the industrial establism. ments have considerably increased the number of their employees, most of there have had all the orders they could conveniently fill. They are busy, and aal likely to be so for some time.

HOURS OF LABOR.

There are very few establishments that work the full sixty hours a week In fact many do not exceed nine hours per day, which is quite enough when we consider the strain in some of our modern factories, owing to the increased speed of the machinery, and the generally high pressure of the work in the various stages. The factories that have worked the full sixty hours per week are principally cotton, woollen, and knitting factories, commencing at 6.30 a.m., and stopping at 6 o'clock, p.m., with one hour for dinner, thus making ten and one-half hours per day, in order to give a shorter day on Saturday. I am pleased to be able to say that there is a great improvement in many of those factories this year. They now start at 7 o'clock a.m., and stop at 6 p.m. Some factories try to cut short the noon hour meal of every day in the week in order to get a shorter day on Saturday. The only practicable remedy is to make Saturday half holiday a lawful right without interfering with their dinner hour. I have frequently heard complaints about overtime, and have heard expressed opinion of employers as well as employees that overtime is injurious alike to the best interests of both, and I am convinced that the amount of overtime sanctioned under the Act is in excess of the necessities, and even of the desire, of those who have the best claim for consideration on the question of overtime. Many women have expressed the wish that the number of days in which overtime was allowed could be decreased. My own opinion is that overtime after sixty hours per week is injurious to the health of young girls and women employed in the factory or workshop. There are employers who deny the advantage of the overtime exemption, who refuse to claim it, and who nevertheless successfully meet the competition of others in the same trade who declare it to be a necessity. I think it would be an improvement to make the provision of four hundred cubic feet

space, one of the conditions of overtime. It is not always the better class of firms with well ventilated rooms that avail themselves of this exemption, but some of those permits are to some of those places not well lighted, nor ventilated workrooms.

Mode of Wearing the Hair.

Considerable trouble has been taken during the year in bringing pressure to bear upon employers, foremen, and even girls themselves to keep their hair securely fastened up during working hours as a precautionary measure against accident. Some difficulty is found in some factories in enforcing this, in others it is carefully observed where the employer is determined to enforce obedience. From time to time we have had serious accidents occur resulting from the hair being caught in machinery. It has been our earnest endeavor to awaken both employer and employee to the serious risk run by a continuance in the dangerous fashion of wearing flowing hair in the vicinity of machinery. A female with her hair hanging down, or wearing flowing ribbons or loose articles of dress should not be employed at or about machinery driven by power. I think we shall have to be very strict in those factories in which this rule is not observed.

Laundries.

The past year may be associated with what it would not be exaggerating to describe a suggestful stride towards a higher degree of assured safety in laundries. The advance, however, was not made in that year alone. It has been a task of several years, and a matter of taxing the patience of laundry proprietors and inspectors alike. I am pleased to be able to state that some new ones have been started in buildings built for the purpose; others have transferred their business from old inadequate buildings to new ones where there is plenty of fresh air; while others have replaced old machinery with a new plant calculated to lessen the labor of the employees, reduce the possibility of accidents, and turn out the work in a better condition. Employers in factories often express annoyance at having to fence machinery. They express keen regret that inspectors cannot deal with machinery makers, but why do not they themselves deal properly with the makers, and see that the machines they get are such that can be legally worked in factories. Why do they not specify for all machinery that it must meet the requirements of the Factories Act? A new plant is started, and the fencing is left until a visit is made from some member of our staff, and the excuse is then made that a safeguarding had been left until an Inspector had called to advise.

Pea-picking.

This industry has expanded considerable within this last two years, and has given employment to a large number of women and girls. The development of this industry is due to the growing demand for peas for the table. These are field growing peas, and the object is to supply only peas of a good color and fairly uniform in size and quality. The pickers in the factories sit in rows at long tables separated into compartments, one for each picker. The peas she has to sort are piled up on the table before her, and she rapidly with both hands separates the peas before her, picking out each pea that appears small or shrivelled. For this good eyesight is required and quick observation. It is trying, I am told, to the eyes and must be a wearisome and monotonous occupation. The busiest time in this trade is during the winter months.

Rag Sorting.

Rag sorting and cutting in connection with paper manufacture is divided into two classes, old rags and new cuttings. The former consists of sorting the old

and unused rags and old east off garments, which are collected, made up into bags, and sent to the paper mills. The cutting up of the garments causes dust in the separation of the different goods,—that is woollen, cotton. or linen. The cutting and sorting is done by women and girls. The rags are placed on tables and shaken over wire girds, when the heavy dirt and dust falls through into boxes, whilst the lighter dust and fibres float about the room. The new cuttings are clean, and are bought at the various factories of clothing. Some of these places are not as well ventilated as they should be. There are some firms which have their rags dusted by machinery before being sorted. So that under any circumstances, the conditions under which the work has hitherto been carried on are likely to be materially improved so far as the dust is concerned. The great inflow of air to replace that exhausted in the process of carrying away the dust will necessitate a further expenditure of maintaining a reasonable temperature in cold weather. It is remarkable that even here the dust does not appear to have had any ill effects on the workers. If the statements of women who have been employed at these works for a number of years are to be believed, and their appearance in no way justifies any doubt in the matter, would it be asking too much that rag sorters be provided by their employers with large over-gowns and head coverings. When one thinks of the dust and other impurities that are taken back to their homes in their clothes and in their hair, and when we realize the few facilities of washing or brushing their clothes, it seems but a small safe-guard to ask for. I would like to mention here, in justice to those who are entitled to the credit, that a number of manufacturers in different branches of trade provide all the workers with suits, aprons and caps, which are washed at the expense of the company.

Complaints.

The investigation of complaints has, as usual, occupied a large, though not an undue, share of the Inspectors' time. Where the writers withhold their names and addresses, it is, of course, impossible to enlighten them as to their mistakes of the law, and they no doubt continue to think that the law is broken and the Inspectors are neglecting their duty. It is curious how often the receipt of a complaint with regard to illegal over-time or other infringements of the law so far as it regulates hours and times of employment, leads to discovering of infringements of provisions, if possible, more fundamental. For example, finding it necessary to visit a factory while in the neighborhood at the close of a normal day, reported to be working over-time, I found no violation of the Act in regard to over-time. I found, however, ill health among the workers, which I was led to attribute to the entire absence of ventilation. The air at any time of the day was vitiated to a certain extent. The last hour of the day was too much for the workers. Seeking to explain to themselves the cause of their misery, I was able to procure for them sufficient ventilation, which removed the scorching gas fumes and sickening air. A number of complaints have been received from employees about the taking of meals in factories, either in the workrooms themselves or rooms unsuitable and unfit for the purpose. A few visits at meal time are sufficient to impress upon one that in this matter of lunch room there is urgent need of reforms in some factories, as regards the conditions under which meals are taken by young women and girls whose days are spent in the factory or workshop. In some places I have seen the meal taken seated on the floor or at the work bench among dust and in an atmosphere tainted by many impurities. It is something gained if a move can be made for one hour out of the workroom to a lunch room; but sometimes, unfortunately, this is an unventilated, dismal room, unswept from week's end to week's end. In such circumstances the advantage is a doubtful one. Some of these factories are

situated far from any place where women can obtain food. They offer no facilities at all, either for warming food or partaking of it. I am pleased to state, however, that these places are in a small minority. Half an hour is too short a time even where good meals and well arranged dining rooms are provided on the premises. It is not a sufficient break in the middle of the day when you consider the time spent in getting from the workroom to the lunch room, in washing hands or waiting the turn to be served. One seems hardly out of the workroom before one is back in it again with all one's dinner in one's throat. Such was the complaint of one girl when describing the difficulty of a half-hour dinner time. It is hard to receive over and over again the complaint: "Do you know we are only allowed half an hour for our dinner?"

Temperature.

There has not been any serious complaint as to the unreasonable temperature in factories or workshops this year, and for the sedentary occupations, a temperature of at least 60 degrees Fahrenheit has been what I have endeavored to get employers to adopt. In my opinion this is by no means too high, although I cannot say it is always reached, especially in very cold weather, but with such changes as we are subject to, it must be very difficult to keep a workshop at an even temperature. I strongly advocate the use of thermometers, and I find that they are getting more generally used. In many small factories and workshops the ventilation is defective. What is wanted is warm air that shall be pure air. Most of the large factories are warmed and ventilated by mechanical means. Some are warmed by hot air or hot water pipes. It is in the smaller factories and workshops that new arrangements are required. The winter time presents the greatest difficulty. Some employers are indifferent to the health and comfort of their workers. They forget that a big airy room which is all right in the summer is not so well in the winter. In one factory the other day I found the temperature was only 40 degrees Fahr. The room was also draughty from holes in the roof, ill fitting windows, and doors. Owing to the greater space for persons generally needed where machines are in use, naturally the question whether there is sufficient air space arises much more frequently in workshops than in factories. On investigating a complaint relating to over-crowding, I found on inspection that it was all right. The floor space certainly appeared to be very full, but there is no prescribed limit for this. I have often noticed in a high workroom that if by chance the full legal number of workers were to be employed, there would certainly not be room for them to do their work owing to the limited floor space.

Ventilation.

This, as usual, has been one of the most difficult problems of workroom inspection. It has always been so because of the structural conditions of the workrooms, and the fact that they were originally designed and built for dwellings and not as rooms to be filled to their utmost cubic capacity with workers. In many workrooms at the present moment, the only means of introducing fresh air are open windows, which means in cold weather that these are kept shut. There is, I suppose, no section of the Factories Act more frequently infringed upon than this section dealing with the maintenance of sufficient ventilation in the workroom. In speaking to employers, I have endeavored to point out that improvement in atmospheric conditions has a double section: Not only is it advantageous to the health of the workers, but they themselves benefit by it. Some of those workshops which suffer most from lack of ventilation are dressmaking establishments, clothing manufacturers, and cigar manufacturers. Methods of ventilation are practically almost impossible in some of those work-

shops, and where attempts are made to bring about improvements, the workers themselves often defeat the object aimed at. It is often a choice between an unwholesome atmosphere and an injurious draught, and the remedy provided is in such cases regarded as worse than the disease. Other places I find sometimes wanting in means of ventilation are the sorting rooms in some of our laundries. Employers do not realize their responsibility in this matter. Can there be any employment in which adequate ventilation is more necessary to the health of the workers than in the sorting room of soiled linen? I have endeavored to insist on this point that all windows should be opened at meal hour when no one would be inconvenienced, so that operators would come back to a workroom full of pure air instead of into impure rooms after their dinner. I am pleased to say that this has done good, but the difficulty is always to get the thing done as a matter of practice, not spasmodically, or only when, for instance, the day is warm.

Sanitation.

A good deal of work has been accomplished during the year in the matter of sanitary accommodation, and the conveniences are approaching something like the prescribed standard. Still there remains a considerable number of places much below it. Considering the improvement that has taken place of late years in sanitary matters, and the activity of most sanitary authorities, it is astonishing to find still in some factories belonging to firms in our principal cities and towns closet accommodation which is a disgrace to civilization. Sufficient attention is not, unfortunately, yet given to the suitability of sanitary conveniences for women. The sanitary conditions may receive full consideration in the construction of new closets, but suitability of position, the securing of privacy of access, and the provision of proper doors and fastenings to each convenience are too often neglected. I have seen new sets of otherwise excellent sanitary conveniences for women in positions where self-respecting women would hesitate to go. Even where suitable accommodation for women has been found in a factory on a subsequent visit, some alteration may have been made which destroys the whole arrangement. Such a case was that of a large factory where in a room in which nearly two hundred women and girls were employed, a mechanic's bench was found to have been placed at the entrance to the closets, so that the employees had to pass this man every time they went in and out of that door. One reason given for this move was the man could watch the women's movements and check waste of time. In pointing out the unsuitability of this arrangement, I was told by the foreman of the room, that this method suited his girls all right. This shepherd depreciating his own flock convinced me of one thing: that where young girls and women are employed that they should have a forewomen. No one can visit factories as we do without being struck with the enormous influence for good effected by the presence of a forewoman of high moral character. The whole atmosphere of a factory seems to be affected by it. There is no complaint in these factories of the vexed question—waste of time. I wish it could be impressed on employees that many employers who have the welfare of their work people at heart, are greatly discouraged in their efforts by the disregard shown for the property of the owners. I have been told over and over again, and I have reason to know that it is true, that the careless treatment of good fittings have resulted in broken basins, choked drains, and many other evils. The danger of this bad treatment lies in the general lowering of the standard of accommodation on future occasions, a material result which is greatly to be deprecated. Associated with the question of sanitary convenience in factory life is the need for washing appliances, felt among the women and girls, which has a moral and social, as well as a strictly hygienic aspect. While it is perfectly certain that the girl or woman who is willing or content to leave

the factory at the end of a day's work with disordered hair, soiled garments, and uncleanly face and hands, is not the most self-respecting of her class, it is a matter for surprise and satisfaction how frequently one is able to note the efforts made in the most unlikely and difficult circumstances by working women to turn homeward with a neat and tidy appearance. Much remains to be done along this line by some employers yet. Every employer should make provision for a cloak room, good lavatories, the means to enable workers to maintain personal cleanliness, and plenty of pure drinking water. I find that where an employer does these things he has a better class of girls to work for him. Whether they become better as a result, or whether the better ones gravitate to that particular factory, I know not; but this I know, that frequently two factories engaged in the same manufacture, paying the same wages, will have workers as different one from the other as is possible under the circumstances, and this I attribute to the fact that in one case the owner expects a higher standard of cleanliness than the others, and where it is expected it is generally found. I sometimes think, when I hear the employers complaining of the workers' carelessness or roughness, that some of them do not yet seem able to realize how rough and primitive are the surroundings in which they sometimes place their employees, nor how closely these two are related. In making these comments on some of the worst places in my district, I cannot pass without mentioning the splendidly equipped factories which have been built in this city, and other cities and towns during the last two years. Another matter clearly parallel with that just touched on is the question of regular periodical cleansing of floors, benches, stairs, wood-work, and windows of work-rooms. No manner of cleansing walls and ceilings is so satisfactory as lime washing, and no manner of cleansing floors is better than scrubbing The dry sweeping which is so often all that is done, while useful, for tidying up, is really not a cleansing process at all, and should not take the place of one. The lime washing of walls may be done, but I find frequently that floors go a very long time without being scrubbed. The use of lime washing machines is increasing, and the owners of factories find them a great saving of time and expense. The manager of a large factory states that where he had to shut the factory and stop the work for two or three days under the old system of lime washing, now all can be done in half a day by using the machine and he can employ his own men to do the work. The amendment to the law which allows us to have spittoons put in workshops and factories contributes not only to the welfare of the work women, but also to the safety of the public.

Children.

The law relating to the employment of children is one that has given this Department more or less trouble to enforce. Its justice cannot be questioned, for the safety of the public depends largely on the education of the children, and if we cannot have the education in any other way, it should be compulsory. The law prohibiting the work of children in factories before the age of fourteen is generally observed. Employers are fully aware of their duties, and live up to them fairly well. The procuring of certificates for children, and keeping them on file, seems to be well understood by employers. At the risk of being monotonous, I would again state that it is surprising how many children we find in the factory who can neither read nor write. The question of education before admission into the factory is a serious matter for the children themselves. Cultivation of the mental faculties would certainly improve the social and moral character of the child. Our work people who are naturally bright would be much more so, if well grounded in the three essentials, namely, reading, writing and arithmetic, before being permitted to work. This should at least be the ground

work for the ambitious to build and improve upon, especially in these days of foreign and interprovincial competition in almost every line of business. I am convinced that our law is doomed to barrenness as a measure of social reform, so long as age alone furnishes the passport of admissibility to the factory. Both Europe and the United States are based on elementary education, and it is hard to understand with our present resources, with a multitude of schools in our large centres and with a powerful concurrence of night schools, that there are still so many illiterate in our factories. Some parents and guardians devoid of conscientious scruples teach their children to falsify as to their age, and thus equipped with falsehood they are sent into the world to seek employment. We need not legislation but an intelligent public opinion, to make our laws effective. We need that every working man may see the evil of sending his children into the factory or workshop. While children are employed, grown people will be idle, and the support of the family will fall upon its weaker members. Many people suppose that the factory laws reach all places where children are employed, but many children are employed in many places other than factories.

Clothing.

The ready-made clothing workshops are not all in as good condition as could be desired, but they have improved gradually during the past year, and I have made a special effort to locate those shops as far as the law permits with salutary effect. Many of those contractors have secured better and cleaner workshops, and even among the most backward there is a marked improvement. One great difficulty is that there is a continual changing of owners of these places. Moving around from place to place makes the inspection a difficult task. The enforcement of the law in relation to sanitary appliances and their proper maintenance is very difficult, and in order that the law be observed frequent visits are required to be made. The condition of the water closets in some of these shops has been a constant source of irritation to the Inspectors. Electric light and power are a very great improvement in those places As a light it is very much better, giving off less heat and no fumes, and as a motor power, the absence of heat and fumes is even more noticeable. The inspection of small places is very important as the sanitary and safety precautions are likely to be disregarded in such places.

Canning Industries.

I am pleased to be able to report that there has been an improvement in some of those canning factories where fruit, vegetables, meat and fowls are put up, but some of them have not reached the proper standard yet. One feels that all preparations of food put up for public use ought to be made with as much regard to cleanliness as if done in our homes. The sanitary accommodation in some of those factories is in a surprisingly bad condition. No attempt to secure privacy is made. The doors were without any fastenings, some even without doors at all. The whole accommodation in some of those places was connected not with a drain but with a cess-pool. A state of things more injurious to both health and morals can scarcely be imagined. The amount of accommodation in some of those places was seriously inadequate, besides being unsuitable and unsanitary. We found children of all ages, and men and women engaged in these industries without any restriction of hours. It is needless to repeat any of the details given in my last report. I merely add, that no experience since that report was made has tended to change my opinion that it is urgently necessary to bring this industry without any exemption within the general regulation of the Factories Act, especially as to limit on the age of children in legal working hours. I have before reported to you on the housing of the workers in this

industry. My experience this year has convinced me that in these homes where such a large number of women and young girls are housed there should be a matron or housekeeper whose duties would be to see that the rooms are kept clean and properly ventilated. The present standard of some of those houses is low regarding cleanliness. We found overcrowding, discomfort, dirty, damp houses, never aired, and those places are offered to the workers, who have absolutely no choice in the matter. What can be said that is not self-evident regarding the employment in those industries for at least twelve, fourteen or more hours in the factory without even elementary appliances for maintaining personal cleanliness In some of the factories, the washing conveniences consisted of a bucket of water, a tap, sometimes a sink, a small piece of soap and either a dirty towel or none at all. There were exceptions to this rule in some places where better facilities for cleanliness were provided. I am sorry to have to state, however, that they are in the minority. In some of these factories, the conditions were so unsanitary as to be a source of danger to the health not only of the individuals employed in these factories, but of the community The proprietors in some of those industries do not seem to realize the importance of the trade nor do they consider the health nor the safety of their workers. This industry has not shared in the benefits which other trades have derived from the Factories Act, owing to its being to so great an extent exempt from regulations

I have the honor to be
Yours respectfully,

MARGARET CARLYLE,
Inspector of Factories and Shops.

REPORT OF MRS. JAMES R. BROWN.

To the Honorable the Minister of Agriculture:

SIR,—I have the honor to submit a report of the inspection of factories and workshops in my district for the year 1905.

The factories on the whole have been fully employed during the year. In many cases the employers have complained of their inability to obtain all the help they required to enable them to fill the orders they had received. In most cases the scarcity of help had reference to female labor, the employment of which appears to be on the increase in factories. This, to a great extent, appears to be the cause of a scarcity of domestic servants, preference being given to factory work owing to the shorter hours of work in factories, and the workers having every evening to themselves, and Sundays as well. In many cases domestic servants are paid as much with board added as is paid in factories in wages alone; yet factory work is preferred.

The majority of employers are very considerate in providing for the comfort of their employees, rightly judging that employees working in comfortable surroundings will work more efficiently and with better results in such conditions than where they do not exist. As a rule workers appreciate the thoughtfulness of considerate employers, which may also account for the preference for factory work. In going through the factories I have been pleased to notice that suggestions which I have made have been carried out, and in some cases even improved upon. In some factories females unable to get home to dinner are provided with tea for lunch, where the Factories Act only requires a room to be provided for eating the lunch. In conversation with some of the employees in regard to their conditions they, while in a measure satisfied with the provisions of the Factories Act for their welfare, have expressed the opinion that where females are employed, and where they perform the same amount of labor as males, they should receive the same pay as male labor, stating that where a female only receives 75 cents a day and a male $1.50, in purchasing an article worth 75 cents the female would give one day's labor, while the male would give only half of a day's labor. Where ten hours is the work day, as in the textile industries, some have thought that the hours might be reduced with advantage. Some employers who have shortened the hours of labor have been entirely satisfied with the result; as where the employees were discontented under the longer hours the work goes on more smoothly and is just as satisfactory, and the output has not been lessened under the shorter hours.

CHILD LABOR

With the increased productive power of labor by the use of labor-saving machinery one might consider the abolition of child labor would have been effected ere this. It is cause for regret that if child labor can be employed with advantage in operating machinery it will continue to be utilized. One manufacturer stated to me that child labor was necessary in the textile industry, as such labor was better adapted in some processes, being quicker, and the small hands being more pliable than those of adult labor, and that the child labor would be preferred irrespective of the question of wages. It is little use blaming any one class for the disabilities to which labor is subjected as long as the present economical conditions exist. It is often stated that parents are to blame, who allow their children to work in factories under a lawful age, but where widows or deserted mothers are left with families dependent upon them it appears to be considered only proper that their children should be exempted from the provisions of the Factories Act, and Inspectors are blamed for enforcing the Act.

That adult labor should be idle while child labor is employed is not very creditable to an enlightened civilization, and would tend to show the necessity for the adoption of a more scientific system of production than at present exists. It may be urged that such children be allowed to be employed in shops, but the pay in shops is less than in factories; hence the preference for factories. Instead of allowing such children to work, they might be provided for either by the Government or by the municipality where the parents reside. The following is a copy of birth certificate sent in by the mother of a child to the employer:

Mr. S———— Smith's Falls, Nov. 15, 1905.
Dear Sir :—

Maggie was born in the month of November, on the 2nd day, 1891, in the town of Brockville, on Wellington Street, at 7 o'clock in the morning, and I hope this will be satisfactory proof.

Yours truly,

Mrs. T————

Having sent in the certificate to the Registrar-General's Department for verification, I received the following statement:—" M. T. was born on the 16th February, 1893." False certificates are one of the difficulties Inspectors have to contend with. In cases where the birth of the child has not been registered, and where a doubt exists as to the age of the child, I require a certificate of baptism or a sworn statement of the parent as to the child's age. I have found in some cases where a sworn statement was required, that the child had been sent to school, and nothing further has been heard of the matter. I think that before children are allowed to work in factories, they should be examined by a medical officer as to their fitness for work, and also that they should be able to read and write. I am of the opinion that children under sixteen years of age should not be permitted to work more than eight hours a day. In passing through some of the mills, one would think by a casual glance at some of the children that they were about nine or ten years of age, but closer look would show that they are stunted in their growth, either by the close confinement or a lack of sufficient nourishment.

Sanitary Conveniences.

When having ordered closets to be supplied in accordance with the requirements of the Factories Act, I have received statements from employers who are also owners of factories that they had sufficient accommodation already. Section 15 of the Ontario Factories Act reads, " The owner of every factory shall provide a sufficient number and description of privies, earth or water-closets and urinals for the employees of such factory, including separate sets for the use of male and female employees, and shall have separate approaches to the same, the recognized standard being one closet for every twenty-five persons employed in the factory." Only when there is a deficiency in the number of closets required, have I taken any action in regard to the matter. I have found in some cases that there were no separate approaches to the closets, but on intimating to the employers that such were necessary, they have made the changes in accordance with the requirements. Complaints have been made that some office buildings where females are employed, are not provided with the accommodation necessary for females, but as the Inspectors have no jurisdiction in regard to offices it is difficult to deal with the matter. Legislation would be necessary to meet the requirements. I regret to state that complaints have been made by some employers, in regard to closets being stopped up by employees in depositing refuse of all kinds in the closets, necessitating the services of a plumber to remove the obstructions, and also the inconvenience to the employees being unable to use the same until the obstruction was removed. I would suggest that the employers provide covered boxes or baskets in closets, and put notices up requiring that refuse should be deposited in the same.

Shops.

There is still room for improvement in providing better conveniences for employees in shops. In places where sewers and water-works have been provided, health authorities should require owners of properties to connect with the sewers and provide proper conveniences for employees, which in many cases are badly required to be substituted for outside closets. I have found, in some cases, a number of closets adjoining each other in yards which, to say the least, is undesirable. The majority of females would rather suffer than frequent such places. I have found in some cases where closet accommodation has been provided, that the workers have defeated the object intended, namely, separation of the sexes, by using the closets promiscuously, although they were labelled, "For Females Only." Wherever I have ascertained such to be the case, I have ordered it to be discontinued.

Conditions.

While the majority of factories are kept in a cleanly state, there are still a number which admit of improvement in that respect. More especially is this the case in regard to the canning factories. While I am aware that it is difficult to attain thorough cleanliness in certain processes, yet improvement may be looked for, and should be attained in all factories where food products are being prepared, and which it is the desire of the Department to obtain. Much depends on managers of the factories. In one case the conditions in which I found the factory were such as to merit censure. On my return I found a new manager who had the conditions so changed, that I can say it was the cleanest of the canning factories in my district. In some of the canning factories, I have found the employees wash their hands in a vat, and as stated to me the water was only changed once a day, which was not conducive to the cleanliness of them. In a number of cases I have found no towels with which to dry their hands. In some cases there is a lack of drainage, or where drainage exists it is defective. I might state that in some cases where employees are paid by piece work, there is a tendency to disregard cleanly conditions, more so than there would be were day work submitted. I am pleased to be able to state that in the canning factories in the eastern district, the employment of child labor is decreasing. I did not find quite as many children under fourteen, nor as many mothers with infants as in the previous year. I have noticed in some cases in cigar factories that the employees, in the making of cigars, put the ends in their mouths to moisten in finishing the cigar. I think the practice is harmful to the employees and to the smokers as well. In every case where I have noticed the practice, I have pointed out the danger and ordered it to be discontinued. While tuberculosis is on the increase, every precaution should be taken to prevent contagion. Spitting on the floors of factories is another evil which should be abolished. In every instance, where I have seen any sign of it, I have ordered spittoons to be provided. Foremen and managers should set an example in regard to remedying the evil.

Rags.

The rag industry merits serious consideration, owing to the demand for cheap goods. Shoddy from rags is used in the manufacture of woollen goods, mattresses, and in other articles as well. I understand, in a number of cases, rags are collected from streets, lanes, yards, or houses where infectious diseases may have existed, and sorted and sold to shoddy manufacturers a[illegible] put through machines without any regard to being cleaned and disinfect[illegible] gislation would be necessary to remedy the evil. Even new rag cuttin[illegible] exempt from infection, as I have seen in a number of cases employe[illegible] them; but I have warned them against the habit and ordered spi[illegible] ded.

Inspectors are not on the premises at all times, but frequent visits will tend in a great measure to put a stop to the practice. I have had a number of fire-escapes erected during the year, but there is still room for improvement in regard to the matter. Owing to removals and additions made to factories constant supervision is necessary in regard to the erection of fire-escapes. Some owners of factories have had fire-escapes erected which were not in accordance with the requirements, although marked copies of the Factories Act had been sent them Where I have found such, I have ordered the provisions of the Act to be complied with. Ignorance of the law is not considered an excuse for a contravention of it. Where the health or safety of the workers is endangered, as in improper fire-escapes, or lack of proper facilities for their health, a prosecution might be necessary to enforce compliance. Where new factories are being erected, it would be well for those interested to comply with Section 51 of the Ontario Factories Act, which reads: "The owner, proprietor or manager of any factory hereafter established and to which this Act applies, shall not begin operation until he shall have received from the Factories Inspector a certificate of inspection of the factory and a permit to operate the same; and any such person violating the provisions of this section shall be liable to the penalties provided for in Section 19 of this Act." Attention to the requirements of this section might result in a saving of expense, were alterations required and the expenses of a prosecution as well. Section 19 reads: "It shall not be lawful to keep a factory so that the safety of any person employed therein is likely to be permanently injured, and whoever so keeps a factory shall, upon conviction thereof, incur and be liable to imprisonment within the common gaol of the county within which the offence was committed, for a period of not more than twelve months, or to a fine of not more than five hundred dollars, with costs of prosecution, and in default of immediate payment of such fine and costs then to imprisonment as aforesaid." As managers of factories are liable under section 51, it would be well that in the case of new factories, they should see that notice has been sent, and a permit granted, as required before they assume their duties as managers, and so avoid any risk of a prosecution.

Ventilation.

During the winter months, ventilation is neglected in factories where it depends on windows only, as when they are closed, no provision is made for a supply of pure air. Some employers think that as long as the air is sufficiently warm for comfort, that is all that is necessary. I frequently recommend that windows be opened in the morning before work is commenced, and at noon hours, but this is a poor substitute for a constant supply of pure air which is necessary for health. In a number of new factories ventilation has been specially provided, which it is claimed gives satisfaction. And while it may be difficult to install a proper system of ventilation in older factories which have been built without any regard to its being considered, yet it is necessary that better ventilation be provided. I trust that in my next report, I may be able to state that a much greater number of factories have been provided with a more improved system than at present exists. Were the Department notified as to a new factory going to be operated as is required by the Act, much expense might be saved, as an Inspector could tell the owners what conditions would meet the requirements, and so prevent any friction by having the conditions in accordance.

Accidents.

Owing to the frequent occurrence of accidents in factories, some of the employees in each factory should be instructed in giving "First aid to the injured," a knowledge of which would be helpful when an accident occurred in mitigating

the suffering of the person injured and perhaps saving life. The St. John Ambulance Association would doubtless provide a surgeon to give the requisite instruction where classes were formed in factories. Employers would confer a benefit by interesting themselves in the formation of classes, and would tend to remove the friction which frequently exists between employers and their employees. The Secretary of the Provincial Board of Health would give information as to the formation of classes for the above object.

Cure for Burns.

The following cure for burns is copied from a report published some years ago: The suffering caused by a burn upon the skin, whether small or great, is intense, as everyone knows, and medical science has only been able thus far to palliate, but not to remove the pain entirely. Chance led to the discovery in the Paris Charity Hospital of a remedy which it is claimed will cause burns to cease from being painful as soon as it is applied, and which will cause injured flesh to heal with marvellous rapidity. Dr. Thierry, one of the surgeons, was in the habit of using picric acid as an antiseptic, and his hands were therefore, impregnated with the solution. One day in lighting a cigarette a portion of the burning match fell on his hands, but instead of feeling it he noticed not the slightest pain. A short time afterwards while sealing a letter some of the burning wax stuck to his finger, and though it cauterized the skin, he felt no sensation. This set him to thinking, and he arrived at the conclusion that the acid had, to use his own words, acted upon the tissues and tightened them. He began a series of experiments in treating burns with a saturated solution of picric acid. All pain was instantly suppressed. He says in his report that after having bathed the wound in a solution of this acid, blisters did not form, and a cure was affected after four or five days. The only inconvenience was that the acid, which is commercially used in the manufacture of dyes, colored the skin yellow, but these stains rapidly disappeared when washed with boric acid. Picric acid, moreover, is odorless, and is neither caustic, irritating nor toxic in its effects. The cheapness of picric acid and the ease with which a proper solution of it may be prepared and kept ready, have induced many of the large manufacturers about Paris, whose workmen are frequently burned at their labors, to place jars within easy reach, so that those injured may be treated with as little delay as possible. In the well regulated household, too, a bottle of picric acid should be added to the useful stock of remedies and always kept on hand. Dr. Thierry does not say how much water to use in the solution, but a pound of acid in a barrel of water is the proportion used in some of the French foundries.

Guarding Machines.

In some of the factories where guards for machines have been provided the girls operating them have removed the guards, as owing to their doing piece work, they are unable to turn out as much work with them as without them. They are willing to risk chances of accidents so as to make more wages. I have warned the girls against the danger of removing the guards. I have been informed that in some of the factories in the States where sewing machines are operated a device has been provided with a view to stop the machines quickly in the event of an accident. A rope passes along the centre of the table which is attached to a clutch coupling, and should an accident occur any of the operators on either side of the table can by pulling the rope stop the machines.

I have the honor to be,

Yours most respectfully,

Annie Brown,
Inspector of Factories and Shops.

ACCIDENTS REPORTED

IN

1905

LIST OF ACCIDENTS

No	Date.	Employer.	Place.	Business.
1	Jan. 6	T. H. Taylor & Co.	Chatham	Flour mill
2	Jan. 5	Taylor Forbes Co.	Guelph	Hardware
3	Jan. 10	International Harvester Co.	Hamilton	Harvest machines
4	Jan. 10	"	"	" "
5	Jan. 4	"	"	" "
6	Jan. 2	"	"	" "
7	Jan. 7	"	"	" "
8	Jan. 12	"	"	" "
9	Jan. 16	Massey-Harris Co.	Toronto	Implements
10	Jan. 19	John Campbell & Son	London	Carriages
11	Jan. 16	International Harvester Co.	Hamilton	Harvest machines
12	Jan. 15	"	"	" "
13	Jan. 13	"	"	" "
14	Jan. 13	"	"	" "
15	Jan. 13	"	"	" "
16	Jan. 21	Lincoln Paper Mills Co.	Merritton	Paper mills.
17	Jan. 15	Canada Foundry Co.	Toronto	Foundry
18	Jan. 3	The Firstbrook Box Co.	"	Packing boxes
19	Jan. 6	Canadian General Electric Co.	Peterboro	Electric works
20	Jan. 6	"	"	"
21	Jan. 9	The Firstbrook Box Co.	Toronto	Packing boxes
22	Jan. 9	"	"	"
23	Jan. 10.	Canadian General Electric Co.	Peterboro	Electric works
24	Jan. 10	The Riordon Paper Mills	Hawkesbury	Paper mils.
25	Jan. 11	Kemp Manufacturing Co.	Toronto	Metal ware
26	Jan. 12	The Firstbrook Box Co.	"	Packing boxes
27	Jan. 14.	The Skinner Co.	Gananoque	Brass foundry
28	Jan. 18	The Frost & Wood Co.	Smith's Falls	Implements
29	Jan. 16	Canadian General Electric Co.	Peterboro	Electric works
30	Jan. 16.	"	"	"
31	Jan. 18	The Ottawa Car Co.	Ottawa	Car works
32	Jan. 23	The Firstbrook Box Co.	Toronto	Packing boxes
33	Jan. 21	Kemp Manufacturing Co.	"	Metal ware
34	Jan. 25	Massey-Harris Co.	Toronto	Implements
35	Jan. 25.	A. Burritt & Co.	Mitchell	Underwear mills
36	Jan. 23	Canada Foundry Co.	Toronto	Foundry
37	Feb. 1	The D. W. Thompson Co.	Toronto	Mattrass factory
38	Jan. 27	International Harvester Co.	Hamilton	Harvest machines
39	Jan. 23	"	"	" "
40	Feb. 4	Thomas Bros.	St. Thomas	Brooms, etc.
41	Feb. 2	D. S. Perrin & Co.	London	Biscuits
42	Jan. 19	John Whitehead.	Cultus	Saw mill
43	Jan. 19	"	"	"
44	Jan. 19	"	"	"
45	Jan. 19	"	"	"
46	Jan. 19	"	"	"
47	Jan. 19	"	"	"
48	Jan. 19	"	"	"
49	Jan. 19	"	"	"
50	Jan. 19	"	"	"
51	Feb. 3	Taylor Forbes Co.	Guelph	Hardware
52	Feb. 7	The Stratford Mill Building Co.	Stratford	Machinery
53	Jan. 5	Arthur P. Holden	Toronto	Machines
54	Feb. 6	The McCormick Mfg. Co.	London	Biscuits, etc.
55	Jan. 31	Massey Harris Co.	Toronto	Implements
56	Jan. 25	International Harvester Co.	Hamilton	Harvest machines
57	Feb. 6	" "	"	" "
58	Jan. 27.	" "	"	" "
59	Feb. 7	" "	"	" "
60	Feb. 6	" "	"	" "
61	Feb. 4	" "	"	" "
62	Feb. 9	" "	"	" "
63	Feb. 9	" "	"	" "
64	Jan. 21	John B. Snider	Waterloo	Office furniture
65	Feb. 10	"	"	" "
66	Feb. 14	Taylor-Forbes Co.	Guelph	Hardware
67	Feb. 18	Massey-Harris Co.	Toronto	Implements

FOR 1905.

Person injured.	Age	Particulars	No.
Kate Anderson	20	Arm badly bruised; accidentally caught her arm under a belt.	1
George Grierson	......	Eyes burnt by splashing iron.	2
W. Hurley	24	Fourth left finger burst; caught between reamer and piece of iron.	3
John Murray	21	Finger badly hurt. While sawing a plank, a piece flew and struck eye.	4
A. E. Miller	32	Fourth left toe badly burst; hammer fell on it.	5
John Molnar	35	Finger burst while handling mould	6
F. K. Phillips	21	Finger burst at end. While unloading wheels, one fell on finger.	7
Robert McKenzie	18	Ends of second and third left fingers crushed; fingers caught in press	8
T. Sheridan	......	Lost part of second finger between first and second joints while operating a foot trip.	9
Alfred Merritt	......	Hand slipped while ripping a piece of board, and saw cut thumb	10
Charles Haines	21	Eye severely bruised and face cut while working on a rip saw; piece of wood struck face	11
S. Struthers	2[illegible]	Finger burst; both legs cut; truck of heavy iron tipped over on him.	12
A. Dunsmore	22	First right finger burst; pinched finger between two trucks	13
Geo. Ducklen	18	First left finger badly cut while grinding a knife	14
Otto Kempff	20	Fourth left finger bruised, and bone fractured.	15
Harold Moore	14	Leg broken between knee and ankle; clothes caught on shaft of paper machine	16
Samuel Sims	......	While rolling pipe had thumb of left hand crushed.	17
Robert Tweddell	33	Middle finger of right hand cut at top on automatic machine.	18
A. Marshall	26	While babbitting bearing, babbit exploded, and eyes and face were badly burned.	19
C. J. Hicks	35	While babbitting bearing, babbit exploded; eyes and face badly burned.	20
Robert McCormack	28	Third and little finger of right hand bruised on dove tail machine.	21
George Gillson	23	First finger of right hand bruised at second joint, on nailer machine	22
Fred. Barrett	43	Face, neck, sides of head and forehead and both hands burned, caused by gases formed while firing shavings into furnace.	23
H. Ferguson	22	Hand, face and neck scalded by steam from pulp digester.	24
Geo. Dick	......	Top of third finger on right hand taken off by press	25
James F. Hall	20	Third finger of left hand cut at top on rip saw.	26
F. Hurst	......	Caught in belt and was taken around the shaft twice, resulting in his leg being broken and chest grazed.	27
Thos. Senior	......	Left foot badly burned; came in contact with ladle of molten iron	28
H. B. Spencer	26	Hand burned; spilled molten solder on back of hand.	29
Dave McDonald	24	First joint of little finger on right hand taken off by pulley falling on it	30
S. Leblanc	61	A piece cut off thumb, and first finger off between first and second joints hand came in contact with circular saw.	31
Jerry Murphy	19	Cut over left eye, caused by being hit with board.	32
G. Clifford	31	Skin lacerated and torn under right arm; clothing caught in shafting down tackle.	33
J. Sherman	......	Fell down stairs; no bones broken, badly shaken up.	34
Wm Graham	......	Coat sleeve caught in shaft, making a flesh wound in arm.	35
R. Thompson	......	While working at a scaffold fell backwards, striking his head on floor.	36
C. Ferguson	......	Left hand cut between thumb and first finger, while working on a trimming saw.	37
John Duncan	40	Front of right leg cut and bruised, while moving a stand of knife sections, it tipped and struck leg	38
Geo. A. Platt	21	Right foot bruised while lifting a binder frame.	39
Guy McDaniels	17	Top of finger cut off on jointer.	40
Henry Thompson	......	Put his right hand out over top of cage of freight elevator causing a common fracture.	41
Michael Aspden	50	* Killed by boiler explosion.	42
Thomas Aspden	26	* "	43
Charles Hanard	50	* "	44
Geo. McCallum	20	* "	45
Freeman Moffatt	21	* "	46
John Gee	......	Injured seriously by boiler explosion.	47
Wallace Whitehead	......	"	48
John Aspden	......	"	49
Allan Moffat	......	"	50
John Reid	......	Finger jammed between casting and drill table.	51
Edward Kane	......	Hand slightly injured on lathe	52
Alex Lebeck	......	Second finger of right hand taken off at first joint while operating a stamping press.	53
C. McCarthy	19	Arm broken; caught in a candy machine.	54
E. McConnell	......	Left forearm cut by a piece which flew from punch while operating in smithy department.	55
John Potter	22	Left hand bruised while taking iron from press.	56
J. Devine	20	Second left finger bruised while driving nails.	57
James Laurie	26	Finger burst at end, slipped on a piece of iron, and hand went against cogs.	58
J. Smith	31	Fourth left finger nail torn off, while lifting heavy iron.	59
Saul Kaplan	24	Second and third fingers cut while filing a casting	60
Cyrus Hendershott	45	Ankle, hip and right knee bruised, fell through a box he was standing on	61
Geo. Stark	19	First, second and third left fingers crushed in die press.	62
B. McSweeny	20	Left hand burned by some hot iron.	63
Werner Knehner	......	Fell from a ladder in lumber shed and injured his back.	64
Geo. La Course	......	Hand squeezed and skin broken, in rollers of sand-papering machine.	55
Leo. Corrigan	......	Finger hurt while operating a drill.	66
H. Miller	......	Ball of right foot burned while shifting in foundry.	67

* Fatal.

LIST OF ACCIDENTS

No.	Date.	Employer.	Place.	Business.
68	Feb. 18	The McClary Mfg. Co.	London	Ranges, etc.
69	Feb. 13	Canada Foundry Co.	Toronto	Foundry
70	Feb 28	The Orangeville Furniture Co.	Orangeville	Furniture
71	Feb 23	International Harvester Co.	Hamilton	Harvest machines
72	Feb. 15	" "	"	" "
73	Feb. 7	" "	"	" "
74	Jan 20	The Canadian Portland Cement Co.	Marlbank	Cement works
75	Jan 5	Cameron Bros.	Hawkesbury	Millers
76	Jan. 23	The Canadian Portland Cement Co.	Marlbank	Cement works
77	Dec. 27	J. Oliver & Sons	Ottawa	Furniture
78	Feb. 1	The Dominion Cotton Co	Kingston	Cotton mill
79	Jan. 19	John Dick	Cobourg	Cotton bags, etc
80	Jan. 30	The James Smart Mfg. Co.	Brockville	Hardware
81	Feb. 8	The Firstbrook Box Co.	Toronto	Packing boxes
82	Feb. 9	Canadian General Electric Co	Peterboro	Electric machines
83	Feb. 14	The Canadian Locomotive Co	Kingston	Locomotives
84	Feb. 16	The Firstbrook Box Co.	Toronto	Packing boxes
85	Feb. 21	Kemp Mfg. Co.	"	Metalware
86	Feb. 21	The Frost & Wood Co	Smith's Falls	Implements
87	Feb. 24	Canadian General Electric Co.	Peterboro	Electric works
88	Feb. 23	"	"	"
89	Feb. 4	"	"	"
90	Feb. 24	The Firstbrook Box Co.	Toronto	Packing boxes
91	Mar 2	The Ontario Malleable Iron Co	Oshawa	Ironfoundry
92	Mar 2	The Canadian Portland Cement Co.	Marlbank	Cement works
93	Mar. 3	The Nordheimer Piano & Music Co	Toronto	Pianos, etc.
94	Feb. 27	Welsh Tanning Co	Hastings	Tannery
95	Mar. 1	Canadian General Electric Co.	Peterboro	Electric works
96	Mar. 3	"	"	"
97	Mar. 1	"	"	"
98	Feb. 24	"	"	"
99	Mar. 6	Sandford Furniture and Woodenware	Fenelon Falls	Furniture, etc.
100	Mar. 11	The Firstbrook Box Co	Toronto	Packing boxes
101	Mar.	Don Valley Brick Works.	"	Brick, etc.
102	Feb. 22	J. H Connor & Son	Ottawa	Washing machines
103	Mar. 14	The Firstbrook Box Co.	Toronto	Packing boxes
104	Mar. 16	The Belleville Hardware Co.	Belleville	Hardware
105	Mar 16	The Firstbrook Box Co.	Toronto	Packing boxes
106	Mar. 1	International Harvester Co.	Hamilton	Harvest machines
107	Feb. 23	Canada Foundry Co.	Toronto	Foundry
108	Feb. 20	Jones Bros & Co.	"	Show cases, etc
109	Feb. 27	The McClary Mfg. Co.	London	Stoves, etc
110	Feb. 25	International Harvester Co	Hamilton	Harvest machines
111	Feb. 25	Canada Foundry Co.	Toronto	Foundry
112	Feb. 23	"	"	"
113	Mar. 1	Thomas Bros.	St. Thomas	Brooms, etc
114	Mar. 3	The Gurney Foundry Co	Toronto	Foundry
115	Mar. 4	The Hamilton Steel and Iron Co.	Hamilton	Steel and iron
116	Mar. 7	" "	"	"
117	Mar 1	The Bertram Engine Co.	Toronto	Engines, etc.
118	Mar. 1	Canada Foundry Co	"	Foundry
119	Mar. 6	"	"	"
120	Feb. 24	The Graham Nail Works	"	Wire nails
121	Mar. 17	Kemp Mfg Co.	"	Metalware
122	Mar. 16	Staunton's	"	Wall paper
123	Mar. 16	The Canadian Portland Cement Co.	Marlbank	Cement works
124	Mar 15	Don Valley Brick Works.	Toronto	Brick works
125	Mar. 13	George Needler	Millbrook	Roller mills
126	Mar. 10	Cornwall Paper Mfg. Co.	Mille Roches	Paper mill
127	Mar. 10	"	"	"
128	Mar. 22	The James Smart Mfg. Co.	Brockville	Hardware
129	Mar. 22	The Firstbrook Box Co.	Toronto	Packing boxes
130	Mar. 22	"	"	"

FOR 1905.—*Continued.*

Person Injured,	Age.	Particulars.	No
Albert Piper	18	Flesh wound on thumb; placed hand on top of die when not necessary.	68
James Wilson	.....	Foot bruised; caught between plank and iron weight.	69
Thomas Reburn	......	Points of four fingers of left hand taken off while operating a jointer.	70
Stephen Murray	34	Legs burned by a truck load of iron.	71
Chester Cornell	22	Thumb crushed under press.	72
B. Keller	......	Foot burned by some hot iron.	73
Herve Louis	20	Right foot cut off with pick-axe.	74
Thomas Comber	......	Fingers on left hand crushed and third finger had to be amputated; caught hand in roll.	75
James Finlan	16	Back and neck injured by a tree striking him.	76
O. Blais	.....	Little finger and part of first finger of right hand taken off in circular saw.	77
George Williamson	26	While endeavoring to take some thread waste off the end of crank shaft; index finger on right hand was broken at second joint.	78
H. Comrie	......	Index finger of right hand cut off on garnett machine.	79
Thos. McIlvenny	......	While operating elevator his right arm was caught between the ground and elevator.	80
Howard McQuillan	18	Thumb at first joint and first and second fingers of right hand cut off on rip saw.	81
F. Holyorne	23	Second and third finger amputated above the first joint while operating double shears; caught hand under blades.	82
D. McKenzie	......	Ankle badly sprained by falling off roof while in the act of opening a window.	83
Ross Jarvis	18	Top of thumb of right hand cut on rip saw.	84
Sherman Seal	19	Thumb on right hand crushed, one half of nail off, while punching can screws.	85
Leslie Paul	......	Foot badly burned while pouring iron.	86
R. Looney	22	Right hand burned on back, between tips of fingers and above wrist by an arc.	87
A. Goodfellow	45	Thumb of right hand taken off below first joint, in buzz planer.	88
Robert Davis	30	Index finger of left hand lacerated and a hole punched through it while operating a punch press.	89
Albert Lavis	22	A sliver from board run in right wrist.	90
Wilfred Ballard	......	Lost part of forefinger in a planing machine	91
Tim Coughlin	38	Right foot crushed; rail fell on it.	92
Robert Stein	16	*Fell three storeys to the basement down freight elevator shaft; died from injuries received.	93
J. W. Carnrike	55	*Wound around shaft, and was instantly killed.	94
E. Howitt	16	Strained back carrying a piece of iron.	95
Joe Lowes	25	Right forearm burned; while testing a machine got his arm up against a live wire.	96
John Frombley	45	Cords of foot strained and bruised; dropped bar of iron on foot.	97
Carmere Asta	45	Thumb of right hand broken while working on derrick; mit caught in shaft.	98
E. Boyee	16	Fingers and left hand squeezed in embossing machine.	99
Robert Ferris	22	Top of second finger of left hand bruised on planer machine.	100
Joseph McCann	......	*Was pulling down a barn, undertook to walk out on a beam, was struck by another beam and fell to the ground, causing injuries from which he died.	101
Jos. Faubert	.....	Finger cut on shaper while grooving staves.	102
Thos. Watson	17	Little finger of right hand cut at side on trimmer machine.	103
Mr. Lonnesbury	......	Lost end of finger while using a drop hammer.	104
Ross Jarvis	18	Thumb and first finger of right hand cut at top on cross cut saw.	105
Thomas Budd	21	Top of first three fingers amputated; caught in rollers of binder	106
Loni Pedro	......	Face burned while drawing a plug out of a drum of sulphuric acid.	107
Edward Meyers	25	Two fingers cut off; came in contact with saw.	108
Roy Swarsz	21	End of second finger of left hand crushed in foot trip.	109
Jos. Wilson	32	Foot burned by some hot iron.	110
Frank Brown	......	Right ankle bruised by pipe falling on it.	111
James Gould	......	Leg bruised by a beam.	112
George Post	37	Right eye struck by a piece of wood from sticker.	113
M. Joyce	......	While pouring iron in mould some splashed in eye.	114
T. Pearson	......	Thumb torn off and arm broken; hand caught in cog wheel.	115
Jack Wilson	......	Skull fractured and left arm broken; slipped off idler, and fell a distance of thirty feet.	116
Geo. Greatwood	39	Toes on both feet crushed by a heavy casting.	117
William Walker	......	Toes of left foot crushed by a car bolster.	118
W. Taylor	......	Eye injured by a piece flying off stay bolt.	119
Geo. White	......	Two bones broken in one foot, and leg scraped; caught leg in kinked rods.	120
Frank Anderson	19	Back of left hand, eye, and cheek burned by some hot metal.	121
Robt. Greenwood	......	Fleshy part of right hand drawn from bone in printing machine.	122
Edward Connors.	26	One rib broken on left side; a barrel of sugar struck him.	123
Samuel Vernon	......	A piece of clay rolled down a bank, striking him on back, bruising cords.	124
Wm. Moore	24	While oiling machinery, caught arm in bevel gearing, tearing it to such an extent that amputation close to shoulder was necessary.	125
Arnold Runions	.....	Two fingers pinched between rollers of calender machine.	126
Irwin Groves	......	Fingers and hand severely bruised; hand was drawn under knife of cutting machine.	127
Allan Coates	15	Palm of hand torn badly; caught in drill.	128
Roy Payne	20	Thumb of right hand cut at top on cross-cut saw.	129
Henry Sheath	25	Right hand bruised on nailer machine.	130

* Fatal.

LIST OF ACCIDENTS

No	Date.	Employer.	Place	Business.
131	Mar 23	The Firstbrook Box Co.	Toronto	Packing boxes
132	Mar 25	Sandford Furniture & Woodenware Co.	Fenelon Falls	Furniture
133	Mar. 27	The Firstbrook Box Co.	Toronto	Packing boxes
134	Mar. 9	The Riordon Paper Mills	Hawkesbury	Paper mills
135	Mar. 29	Warmwith & Co.	Kingston	Pianos
136	Mar. 28	Colonial Weaving Co.	Peterboro	Weaving
137	Mar. 31	W. H. Lailey & Co.	Toronto	Tailored clothing
138	Apr. 6	The Canadian Portland Cement Co.	Marlbank	Cement works
139	Mar. 30	The Preston Furniture Co.	Preston	Furniture
140	" 28	Kemp Mfg. Co.	Toronto	Metalware
141	" 31	McDonald Mfg. Co.	"	Tinware
142	" 7	International Harvester Co.	Hamilton	Harvest machines
143	Feb. 10	"	"	"
144	Mar. 14	"	"	"
145	" 7	"	"	"
146	" 11	"	"	"
147	" 10	"	"	"
148	" 9	"	"	"
149	" 16	Canada Foundry Co.	Toronto	Foundry
150	" 20	"	"	"
151	" 11	"	"	"
152	" 18	The Knetchel Furniture Co.	Hanover	Furniture
153	" 18	Massey-Harris Co.	Toronto	Implements
154	" 21	Krug Bros. & Co.	Chesley	Furniture
155	" 14	Canada Foundry Co.	Toronto	Foundry
156	" 21	The Knetchel Furniture Co.	Hanover	Furniture
157	" 20	The Goldie & McCulloch Co.	Galt	Foundry
158	" 22	John Dick	Seaforth	Cotton bags, etc.
159	" 22	The Morton Mfg. Co.	Hamilton	Tin Cans
160	" 28	International Harvester Co.	"	Harvest machines
161	" 27	"	"	"
162	" 23	"	"	"
163	" 29	"	"	"
164	" 29	"	"	"
165	" 7	"	"	"
166	" 16	"	"	"
167	" 16	"	"	"
168	" 16	"	"	"
169	" 15	"	"	"
170	" 23	Miss Connor	Hamilton	Tailoring
171	Apr. 1	Semmens & Evel	Hamilton	Undertakers
172	Apr. 3	Kilgour Bros.	Toronto	Printers
173	Mar. 15	International Harvester Co.	Hamilton	Harvest machines
174	Mar. 12	The Paris Plow Co.	Paris	Plows.
175	Apr. 5	Thomas Bros.	St. Thomas	Brooms, etc.
176	Apr. 6	Imperial Cotton Co.	Hamilton	Cotton
177	Apr. 1	The Sanderson Harold Co.	Paris	Refrigerators, etc.
178	Mar. 29	The Sherlock Manning Organ Co.	London	Organs
179	Apr. 5	International Harvester Co.	Hamilton	Harvest machines
180	Apr. 5	"	"	" "
181	Apr. 5	"	"	" "
182	Apr. 4	"	"	" "
183	Apr. 7	E. Leonard & Sons	London	Engines
184	Apr. 7	"	"	"
185	Apr. 8	International Harvester Co.	Hamilton	Harvest machines
186	Apr. 6	"	"	" "
187	Apr. 10	Canada Mill	Cornwall	Cotton mill
188	Apr. 3	Cowan & Britton	Gananoque	Nails, etc.
189	Mar. 31	Y. White	Lakefield	Sawmill
190	Apr. 13	Stormont Mill	Cornwall	Cotton mill
191	Apr. 14	Canada Mill	"	"
192	Apr. 12	J. A. Harrison	Toronto	Coal and wood
193	Apr. 6	S. Y. Bullis	Athens	Saw mill

FOR 1905.—*Continued.*

Person injured.	Age.	Particulars.	No.
Norman Copping.........	18	Left hand severed at wrist on a buzz planer.	131
W. McDevitt	25	Thumb of right hand taken off above first joint on rip saw.	132
Earl Palmatter	20	Second finger of right hand cut at top on trimmer machine	133
Albert Prevece......	24	Adipose tissue about elbow torn away, through having arm caught in gear.	134
M. Asseltine	.....	The first, second, and third fingers taken off at second joint on jointer knife	135
Nellie Wilkins	18	Hair caught in a set screw on shaft, injuring the scalp and cords of neck	136
Jenny Cruikshanks	20	Attempted to get on the elevator while it was in motion, and fell down the shaft to basement; there is a cut on one side of her face, and she was rendered unconscious by fall	137
William Vance........ .	50	Left side, breast and right leg, jammed by a vent of building.	138
Albert Pulkowski	......	A piece of wood was thrown back from a saw, striking him on the arm and penetrating flesh	139
Arthur Hather	18	First finger on right hand crushed in press.	140
Harry Symington	....	Attempted to jump on moving hoist, but slipped, and was caught between ceiling and platform of elevator	141
F. K. Reich	22	Third finger of left hand bruised while cutting a rivet chisel slipped	142
Charles Wilkin...........	27	First right finger cut on a sharp piece of iron	143
Joseph V. Harvey	44	Side and head bruised, while repairing a belt fell to floor about twelve feet below	144
Samuel Babin	22	Right foot burned while pouring hot iron	145
Charles Hayes	11	Ankle sprained; fell off rear end of car while shunting	146
Theo. Schumaker	30	First left finger cut while boring a casting.	147
A. Alderson	20	Thumb burst; struck thumb with hammer	148
W. Newton.....	.....	Leg bruised; jammed between hoists and skids	149
C. Preston	....	Leg broken; a stringer was being lowered and struck a pile of eyebars which fell on leg.	250
J. Moore	......	Foot bruised by a beam falling on it	151
J. Bohnardt	....	Second finger of left hand cut off and palm of hand cut while operating grooving saw.	152
W. Odell..................	......	Slightly burned about the face and head while assisting to pour off iron	153
H. Mincher	....	Nail of little finger injured; caught in set screw	154
A. Burns	.	Finger smashed; caught between rolls.	155
Alfred Hehn		While operating a shaper machine cut palm of right hand.	156
Charles Allen	18	Last three fingers of left hand cut off; hand caught in ram of hydraulic punch.	157
R. Steele.................	.....	Fingers crushed in rag picking machine.	158
Frank Feaver	18	Cords of finger cut, caught in sprocket chain	159
A. Manning	49	First right finger burst while handling a die; finger caught between die and truck.	160
Arthur Lay	35	First and second right fingers torn on saw.	161
Andrew Parker	.	Third left finger amputated; hammer came down and caught finger.	162
Adam Yedow	36	Feet burned by some hot iron.	163
Toomas Chapman........	....	Left shoulder bruised; slipped down stairway.	164
R. Kosney	30	Heel burnt, hot iron splashed on foot	165
Ed. Herbert..	26	Right thumb burst; hammer struck thumb.	166
Robert Magnus.	27	Two toes bruised, truck wheel ran over toes.	167
J. Smuck	22	Second and third right fingers crushed in cutters of milling machine	168
M. Tossian...............	21	Large right toe bruised; annealing pot fell and struck foot	169
Oliver Clegg	15	While attempting to hook the belt on machine operated by another employe; her hair was caught in the shafting and scalp torn off	170
E. G. Coppins.......	.....	While ripping a piece of board cut hand on rip saw.	171
E. Jacobs.....	.	Big toe on right foot bruised, caught in hoist	172
Louis Beemer.. ..	60	Knee bruised; struck knee on truck	173
Mortimer Hawley.......	30	While working at an upright boring machine shirt sleeve caught and wound arm into contact with same, lacerating fleshy part of arm	174
L. Black.....	21	Arm cut above wrist by a circular saw	175
May Neville	.....	Was hit in stomach by truck of yarn	176
Herbert Laine..	......	Little finger of left hand severed between first and second joints while operating square shears.	177
N. Devine........... ...	16	Top taken off one finger, was jammed by a board coming through planer	178
John Silver	20	First and second left fingers crushed under drop hammer	179
Peter Mastermak..	31	Leg bruised, got on elevator while it was in motion, and leg caught between elevator and floor	180
Martin Cajka..	30	First and second left fingers burst; hammer dropped on fingers	181
James Parker	38	Second right finger badly torn on a wheel	182
Chas. Donaldson	.....	Slight wound in forehead, was struck with a hammer	183
Angus Buchanan	....	Front finger on right hand smashed by a hammer	184
Anton Agoe	29	Left elbow fractured and dislocated while lifting a machine.	185
J. J. O'Connor. ...	36	Left leg bruised, while repairing elevator fell about three feet	186
Israel Sauve.....	58	Right hand caught between belt and small pulley underneath a planing machine; hand lacerated	187
Edward Randall .	.....	One leg and one arm broken; got caught in the upright shafting leading from the water wheel	188
Michael Greer	....	Skull was cut and jaw bone severed, fell on a revolving saw.	189
William Lafleur.	24	Left arm amputated below elbow, caught in feed roller of cotton opener	190
Leo Leger	16	Lost third finger and part of second; hand caught between rolls and spiked cylinder.	191
Edward Oldfield	24	*Was standing near a revolving shaft, sleeve of coat caught in shaft, and he was so badly crushed that he died	192
—— Wiltse	8	While taking heading from shingle saw was looking around carelessly and had two fingers severed.	193

* Fatal.

LIST OF ACCIDENTS

No.	Date.	Employer.	Place.	Business.
194	Apr. 17	The Firstbrook Box Co	Toronto	Packing boxes
195	Apr 17	"	"	"
196	Apr. 17	"	"	"
197	Mar 17	The Ottawa Car Co	Ottawa	Car works
198	Apr. 19	The Rathbun Co	Deseronto	Cedar mill
199	Apr. 10	The Cornwall Furniture Co	Cornwall	Furniture
200	Apr. 11	J. D. Shire Lumber Co	Bracebridge	Lumber
201	Apr 21	The Canada Portland Cement Co	Marlbank	Cement works
202	April 13	Massey-Harris Co	Brantford	Implements
203	April 6	The Brantford Stoneware Co	Brantford	Stoneware
204	April 21	The McGregor, Gourlay Co	Galt	Toolshop
205	April 6	United Factories	Toronto	Brushes, &c.
206	April 17	R. Truax & Co	Walkerton	Builders' supplies
207	April 12	International Harvester Co	Hamilton	Harvest machines
208	April 13	Semmens & Evel	"	Undertakers
209	April 25	Kilgour Bros	Toronto	Paper boxes, &c
210	April 22	The Sutherland Innes Co	Chatham	Lumber
211	April 24	Taylor Forbes Co., Ltd	Guelph	Hardware
212	April 27	Bean & Westlake	Woodstock	Biscuits
213	April 29	Whitman & Barnes Mfg. Co	St. Catharines	
214	May 3	Taylor, Forbes Co	Guelph	Hardware
215	March 25	John McDonald	Walton	Saw mill
216	April 25	Canadian General Electric Co	Peterborough	Electric works
217	April 25	Cornwall Paper Mfg. Co	Mille Roches	Paper Co
218	April 28	The James Smart Mfg. Co	Brockville	Hardware
219	April 29	Barchard & Co	Toronto	Packing boxes
220	April 28	The Canada Portland Cement Co	Marlbank	Cement works
221	April 6	The W. W. Chown Co	Belleville	Hardware
222	May 3	The Firstbrook Box Co	Toronto	Packing boxes
223	May 4	The Canada Portland Cement Co	Marlbank	Cement works
224	April 25	The W. Hamilton Mfg. Co	Peterborough	Machinery
225	April 27	John Briggs & Son	Brockville	Wood work
226	May 11	W. Hamilton Mfg. Co	Peterborough	Machinists
227	May 18	The Firstbrook Box Co	Toronto	Packing boxes
228	May 15	Don Valley Brick Works	"	Brick works
229	May 19	Canadian General Electric Co	Peterborough	Electric works
230	May 26	Sylvester Mfg. Co	Lindsay	Implements
231	June 1	Canadian General Electric Co	Peterborough	Electric works
232	May 5	Krug Bros. & Co	Chesley	Furniture
233	May 5	Imperial Cotton Co	Hamilton	Cotton mill
234	April 28	International Harvester Co	"	Harvest machine
235	May 2	"	"	"
236	April 27	"	"	"
237	" 27	"	"	"
238	" 25	"	"	"
239	" 24	"	"	"
240	" 13	"	"	"
241	May 10	The McClary Manufacturing Co	London	Stoves, etc.
242	April 28	The Huntsville & Bracebridge Tanning Co	Huntsville	Tannery
243	May 6	Gourlay, Winter & Leeming	Toronto	Pianos
244	" 10	Krug Bros & Co	Chesley	Furniture
245	" 11	Imperial Cotton Co	Hamilton	Cotton mill
246	" 13	The Can. Colored Cotton Co	Hamilton	"
247	" 5	Canada Cycle & Motor Co	Toronto Junction	Motors, etc
248	" 19	Taylor-Forbes Co	Guelph	Hardware
249	" 6	A. Bauer & Co	Waterloo	Cotton waste
250	" 18	The Waterloo M'f'g Co	Waterloo	Engines, etc
251	" 12	John Heard & Co	St. Thomas	Carriage wood work
252	" 6	International Harvester Co	Hamilton	Harvest machines
253	" 4	"	"	"
254	" 8	"	"	"
255	" 8	"	"	"
256	" 9	"	"	"
257	" 12	"	"	"
258	April 17	"	"	"
259	May 15	"	"	"
260	" 16	"	"	"

FOR 1904.—*Continued*.

Person injured.	Age	Particulars	No.
Chas Murphy	38	Middle finger of right hand cut at top on pin machine.	194
Alfred Roberts	26	Bruise over lower joint of thumb of right hand	195
James Martin	19	Thumb and first finger of right hand cut at top on rip saw	196
R. Clairoux	56	While working at one of the forges was struck in the eye by a piece of flying iron.	197
Frank Howard	19	Fleshy part of left arm torn in gear.	198
James Morgan	23	Three fingers of left hand amputated; hand hurt on shaper.	199
Alex McKay	.....	Leg wounded below the knee; clothing caught in cogs.	200
Andrew Pringle	30	Left hand jammed between two cars	201
E. R. Vaughan	53	Rib broken while in the act of filing a tumbling mill; his apron was caught in wheel and the sudden wrench caused the injury.	202
Gordon Martin	...	Hand badly mangled in a cog wheel.	203
Sidney Webb	15	Crushed in a hoist and was killed.	204
Percy Call	.....	Finger crushed in brush filling machine.	205
Joseph Culliton	...	Arm cut on a butting saw.	206
Chas Hayes	21	Foot amputated at instep; went between cars and wheel passed over it.	207
George Mills	..	Part of little finger of right hand amputated; struck finger against saw.	208
Earl Norton	.	Middle finger left hand injured on ending machine.	209
John Neoby	39	Hand cut off at the wrist; while re-sawing bolts, saw caught his coat sleeve and pulled his hand in.	210
A. McKay		While erecting a scaffold fell a distance of fourteen feet, spraining both ankles.	211
S. A. Martin	...	Fractured his leg by falling down cellar.	212
Edwin Steel		Lost part of one finger and cut other fingers on circular saw	213
William Reid	..	Eye injured; caused by drill breaking in machine which he was operating.	214
John Grimoldby		While edging a board his hand was thrown against saw severing three fingers and thumb of right hand.	215
Wm. Pundhard	23	Both hands and right leg burned, fell into a pot of boiling compound.	216
John Ray	.	Two fingers pinched in the rollers of supercalender.	217
Harry Belmont	22	The injured man was leaning over a shaft to hang up a belt when his clothing caught in a pulley, and he was thrown about eight feet breaking right arm and left ankle.	218
W. Payne	15	Got his hand jammed by nailing machine.	219
Geo. Dale	40	*Caught in a tube mill gear and was instantly killed.	220
W. C. Chaplin	...	Lost part of first finger on left hand and injured second finger in a press.	221
Robert Thompson	21	Right foot sprained on hand saw gearing.	222
Wesley Pringle	24	Dislocated arm at shoulder by a large piece of marl.	223
W. Wilson	.	While unloading boiler plate from car had one of his toes broken	224
John R Boyd	48	First joint of left thumb cut off on jointing machine.	225
W. O'Brien	.	Finger jammed between casting and planers	226
John Henderson	25	Thumb of right hand severed at first joint on rip saw.	227
Wm. Bennett	......	One finger amputated, and another crushed in, placed his hand on a machine while in motion.	228
Roy Walker	19	Finger amputated at first joint while grinding tool on emery grinder, had index finger of right hand caught between tool and wheel.	229
Dennis O'Leary	25	Three fingers on left hand cut off; hand caught in gearing of lathe	230
Harry Lloyd	16	Left hand burned by an arc.	231
F. Labsinger	..	Four fingers of left hand cut at first joint; while attempting to pick up something, carelessly put his hand on grooving saw	232
Bruce Willamson	.	Right foot badly smashed	233
Roy Rattenberg	21	Hand severely cut; while fitting a bar, caught hand on knife.	234
R. Hutchinson	38	Right wrist strained and one bone broken; climbed up between mower frames, fell and struck wrist.	235
Roger Richardson	52	Side of left eye and forehead cut; fell into kiln.	236
James Arrol	17	Finger crushed; caught in forge machine.	237
Robert Radford	44	Top of head cut; struck against cog wheels	238
Pat Gibbons	55	Back of left hand cut by a piece of iron from drop hammer.	239
M. Kelliher	27	Right foot burned; while pouring iron some splashed on foot	240
Thomas Dyke	18	Hand cut by a piece of tin.	241
George Scott	22	While oiling bearings caught in shaft He received a scalp wound one arm wrenched, and slight fracture above elbow.	242
Geo. Thomson		Lost two fingers while running a jointer	243
James Taylor	...	Fingers on right hand injured on grooving saw.	244
Bruce Williamson	.....	Toe crushed by a roll falling on it.	245
James Madden	42	End of second finger of right hand crushed while cleaning a loom	246
James Bell	..	Right hand lacerated while unloading steel from truck	247
Menzie Ross	.	Fell from the side of a car a distance of twelve feet, receiving a severe shaking up.	248
August Hannenberg	51	*Struck by a bursting tire and was instantly killed.	249
Mr. Lackenbauer	30	Cheek bone fractured just below the eye and flesh badly lacerated by a punch	250
Geo. Robinson		While running a bolting saw did not return table to its proper position, and placed hand against saw severing it at wrist.	251
F. Hirsch	24	Finger jammed between two trucks.	252
John Vereb	27	Foot burned by some hot iron.	253
A. C. Montour	22	Foot bruised; rake fell on it.	254
T. Downs	23	First right finger cut off while fitting a knife on binder table	255
N Vailevig	32	Punch fell on thumb, crushing it	256
Jos. Dixon	.....	Foot bruised; fell off a pile of wheels	257
Brono Simon		Arm burned by some hot iron	258
Chas Wilson	31	Right leg bruised by a truck	259
J Bell	59	Toes bruised; heavy piece of iron fell on foot.	260

* Fatal.

LIST OF ACCIDENTS

No.	Date.	Employer.	Place.	Business.
261	May 16	International Harvester Co.	Hamilton	Harvest machines
262	" 1	"	"	"
263	" 20	Hanover Specialty Co.	Hanover	Furniture
264	" 4	R. Truax & Co.	Walkerton	Builders' supplies
265	May 13	Kemp Mfg. Co.	Toronto	Metalware
266	April 4	The McGregor, Gourlay Co.	Galt	Machinery
267	May 8	Rolph & Clark	Toronto	Engravers
268	May 12	A. B. Jardine & Co.	Hespeler	Machinists
269	May 12	The Lincoln Paper Mills Co.	Merritton	Paper mills
270	May 22	The Niebergall Stave and Lumber Co.	Staples	Lumber
271	May 22	"	"	"
272	May 22	"	"	"
273	May 22	"	"	"
274	May 22	"	"	"
275	May 22	"	"	"
276	May 22	"	"	"
277	May 22	"	"	"
278	May 25	International Harvester Co.	Hamilton	Harvest machines
279	May 26	"	"	"
280	May 26	"	"	"
281	May 27	"	"	"
282	May 31	George McAllister	Guelph	Lumber
283	May 22	International Harvester Co.	Hamilton	Harvest machines
284	June 5	The Firstbrook Box Co.	Toronto	Packing boxes
285	May 23	Raven Lake Cement Co.	Raven Lake	Cement works
286	June 6	The Peter Hamilton Co.	Peterboro	Implements
287	May 16	King Edward Hotel Laundry	Toronto	Laundry
288	June 7	The Rathbun Co.	Deseronto	Sawmill
289	June 8	The Eclipse Manufacturing Co.	Ottawa	Furniture
290	June 6	The Pedlar Metal Roofing Co.	Oshawa	Sheet metal
291	June 12	The Cobourg Matting and Carpet Co.	Cobourg	Matting, etc.
292	May 10	The Cossitt Company	Brockville	Implements
293	June 21	Canadian General Electric Co.	Peterboro	Electric works
294	June 22	The Rathbun Co.	Deseronto	Cedar mill
295	June 22	Canada Colored Cotton Mills Co.	Cornwall	Cotton mill
296	June 27	The Canadian Portland Cement Co.	Marlbank	Cement works
297	June 25	Canadian General Electric Co.	Peterboro	Electric works
298	July 3	"	"	"
299	June 1	Wolsen & McEwan	Blind River	Lumber
300	May 31	International Harvester Co.	Hamilton	Harvest machines
301	June 5	" "	"	"
302	June 3	" "	"	"
303	June 3	The Montrose Paper Co.	Thorold	Fine paper
304	June 8	The John Goodison Thresher Co.	Sarnia	Threshers
305	June 12	The Knetchel Furniture Co.	Hanover	Furniture
306	June 8	The Waterous Engine Co.	Brantford	Engines, etc.
307	May 31	The Canadian Colored Cotton Co.	Hamilton	Cotton mill
308	June 5	International Harvester Co.	"	Harvest machines
309	June 3	" "	"	"
310	June 10	G. C. Brooks	Niagara Falls	Gas engines
311	June 15	Massey-Harris Co.	Brantford	Implements
312	June 10	The Goldie & McCulloch Co.	Galt	Machinists
313	June 17	International Harvester Co.	Hamilton	Harvest machines
314	June 16	" "	"	"
315	June 14	" "	"	"
316	June 14	" "	"	"
317	June 13	" "	"	"
318	June 12	" "	"	"
319	June 12	" "	"	"
320	June 14	Canada Foundry Co.	Toronto	Foundry

FOR 1905.—*Continued.*

Person injured.	Age.	Particulars.	No.
Wm Duffy	20	Left leg bruised; while handling large timbers, one fell on leg.	261
V. Brill	38	Right hand punctured; ran a wire into hand	262
George Becker	......	While starting a new cut, knives tore the work out of his hand cutting out a large part of bone, and breaking it between hand and elbow.	263
Philip Truax	......	Palm of hand cut on a cross-cut saw.	264
Geo. Hatton	23	First finger of left hand bruised by a press.	265
W. J. McIlroy	.	Injured by a board which was thrown back from a machine.	266
James Bushby	..	*Was riding on hoist between ground and first floor and his leg became crushed between hoist and floor; died from shock and loss of blood.	267
Herman Prestien	..	Two fingers of right hand lacerated by a circular saw.	268
Gordon Pettigrew	18	While walking upstairs became dizzy and caught belt on shaft to prevent himself from falling.	269
Ralph Walsh	55	*Killed by boiler explosion.	270
Joseph Daust	40	Scalp wounded by boiler explosion.	271
John Riley	45	" " " "	272
Oliver Lorando	48	" " " "	273
Rufus Warner	45	Side injured " " "	274
Oliver Chevalier	40	Arm " " " "	275
James Bailey	35	Leg " " " "	276
Robert Fisher	38	Side scalded and scalp wounded by boiler explosion.	277
Yarek Katorsyna	18	Palm of hand burned; hand went against oil furnace.	278
Annie Kretowisz	17	Right foot cut; stepped on a sharp piece of glass.	279
R. F. Thornton	43	Finger nail torn off; struck finger with hammer.	280
Mike Kroslok	20	Foot severely burnt; while pouring iron some ran into shoe.	281
Chas. Brohman	15	Right hand cut off by a small saw.	282
Albert Rhodes	25	First left finger cut by a piece of glass.	283
James Shields	.	First finger of right hand cut and thumb cut through top at nail on rip saw	284
Robert Wilcox	35	*Right arm torn off; left, broken in two places; died May 26 from injuries. Caught in machinery while running a tube mill.	285
W. Stinson	..	While using circular rip saw, the piece he was cutting flew back and struck him on hip bone.	286
Miss Lou Corbett	..	Hand caught in an ironing machine and bruised.	287
Arthur Slandran	20	*Was struck in stomach by board flying back from edger; died on June 9 from injuries.	288
James Ray	..	Two fingers of left hand crushed by a drop hammer.	289
E. McHally	..	Two fingers bruised by a lever breaking and allowing a weight to drop on finger.	290
Fanny Rogers	..	Little finger of right hand slightly damaged by a cog on the loom.	291
William Darling	32	Fingers cut with jointer	292
Jas. Bellegham	29	While operating punch press got index finger of left hand under punch; index finger amputated at first joint.	293
Patrick McGuiness	43	Back of right hand cut on splitter.	294
Clifford Harp	16	Index finger of right hand caught in looper of power sewing machine; looper went through finger.	295
Herbert Brisbin	17	Right leg off just below the knee; caused by collision between motor and cars.	296
Robt. Fanning	54	Instep of right foot bruised while taking props from under a big casting.	297
E. Slight	19	First, second, and third fingers of right hand badly lacerated, second finger almost amputated at first joint, and third finger broken, while operating a punch press.	298
Robert Smith	45	Small bone in left leg fractured above ankle; bolt flew back from lath bolter.	299
Jake Walsh	36	Legs and chest bruised, a pile of rake frames fell on him.	300
L. S. Hunter	46	First left finger cut at top by a knife.	301
John Nally	25	Right foot bruised, while fixing ladle shank fell.	302
J. Wishart	32	Was caught in a belt which drives the dynamo; sustaining a scalp wound, a sprained knee and a general shaking up.	303
W. Elliott	......	Point of third finger on left hand taken off at first joint; caught in gear on lathe.	304
Frederic Becker	40	While engaged feeding a planer allowed his left hand to be drawn between rollers, taking off two fingers.	305
Chas Pearcey	23	Right hand very badly crushed by an electric crane.	306
Wm. Dashpur	55	End of second finger on left hand pinched off while placing a warp beam on the drawing-in stand.	307
Wm. Lynch	23	While handling a bar it fell and point of guard ran into foot.	308
L. Lorenzo	27	Foot slightly burned; while pouring iron some splashed on foot.	309
Jos. Brundsit	.....	While putting on feed belt ran his hand through feed gears, severing four fingers.	310
Geo. Douglas	.....	The injury consists of an abrasion of the skin around the right side and the back, caused by coming in contact with pulley on line shaft.	311
Frank Glendenning	35	Foot severely burned; molten metal spilled from ladle	312
Ed. Johnson	24	Left groin and abdomen cut and bruised; emery wheel burst and struck him.	313
Geo. Monougian	45	Fourth finger cut; caught in crane chain.	314
H. Maradian	37	Leg burnt by some hot iron	315
M. Matusian	21	Right leg burned while pouring iron.	316
Alex. Neil	21	Finger burst at end while working on riveting machine	317
H. Kavarkian	25	Ankle bruised; a truck wheel ran over it.	318
A. Gage	23	Back of right finger cut while adjusting a machine, hand struck a cog.	319
E. J. Lea	.....	While looking over iron in racks, slipped and struck leg against angle iron, causing a gash in his leg	320

* Fatal.

LIST OF ACCIDENTS

No.	Date.	Employer.	Place.	Business.
321	June 21........	The Knetchel Furniture Co..........	Hanover..........	Furniture..............
322	June 22..........	The Stratford Mill Bldg. Co............	Stratford.........	Mill building...........
323	June 22..........	" "	"	" ....
324	June 21..........	The Massey-Harris Co..............	Toronto..........	Implements............
325	June 9...........	International Harvester Co..........	Hamilton........	Harvest machines........
326	" 7...........	"	"	" ....
327	" 5...........	"	"	" ....
328	" 5...........	"	"	" ....
329	" 20...........	"	"	" ....
330	" 19...........	"	"	" ....
331	" 20..........	"	"	" ....
332	" 22...........	"	"	" ....
333	" 23..........	Nicholson & Brock...............	Toronto..........	Bird seed, etc............
334	" 17..........	International Harvester Co........	Hamilton........	Harvest machines.......
335	" 28..........	The Kemp M'f'g Co..............	Toronto..........	Metalware..............
336	May 26...........	W. W. Carter..................	Fesserton........	Lumber................
337	June 27..........	The Barrie Carriage Co..............	Barrie...........	Carriages..............
338	" 28..........	United Factories, Ltd..............	Toronto.........	Brushes, etc............
339	" 29..........	Parkin Elevator Co................	Hamilton........	Elevators, etc...........
340	" 13..........	International Harvester Co...........	"	Harvest machines........
341	" 20...........	"	"	" ....
342	" 20...........	"	"	" ....
343	" 23..........	"	"	" ....
344	" 23...........	The Columbia Handle and Lumber Co.	London........	Lumber, etc............
345	" 24..........	The McClary Mfg. Co..............	"	Stoves, etc.............
346	" 27..........	Taylor Forbes Co..................	Guelph..........	Hardware..............
347	" 22...........	The Canada Chemical Mfg Co.......	London..........	Chemicals..............
348	" 23..........	The McClary Mfg Co..............	"	Stoves, etc.............
349	July 4..........	The Brantford Carriage Co............	Brantford........	Carriages..............
350	June 27..........	John Dick.......................	Toronto.........	Cotton bags............
351	" 30..........	The Rathbun Co.................	Deseronto........	Cement works...........
352	" 30..........	"	"	" ....
353	July 3..........	"	"	Cedar mill..............
354	" 4..........	Can. General Electric Co.............	Peterborough.....	Electric works..........
355	" 10..........	The W W Chown Co..............	Belleville.........	Hardware..............
356	" 10..........	The Rathbun Co..................	Deseronto........	Door shop..............
357	" 13..........	J. R. Booth......................	Ottawa..........	Lumber m'f'rs...........
358	" 11..........	The Riordon Paper Mills.............	Hawkesbury......	Paper..................
359	" 14..........	The Riordon Paper Mills.............	Hawkesbury......	Paper..................
360	" 17..........	The James Smart M'f'g Co............	Brockville........	Hardware, stoves, etc.....
361	" 27..........	Canadian General Electric Co..........	Peterborough.....	Electric works...........
364	May 19..........	John B. Smith & Sons...............	Callander........	Lumber................
365	" 20..........	The Firstbrook Box Co...............	Penetang........	Packing boxes...........
366	" 25..........	Tanner Bros......................	Waubaushene....	Lumber................
367	June 15..........	Kemp M'f'g Co....................	Toronto..........	Metalware..............
368	July 17..........	"	"	" ....
369	" 17..........	"	"	" ....
370	" 13..........	Rainy River Lumber Co..............	Rainy River......	Lumber mill............

FOR 1905.—*Continued.*

Person injured	Age	Particulars.	No.
S. Luesing		While operating a spindle carving machine, his finger came in contract with knife injuring first and second fingers	321
J. Bowling		While drawing a shaft out of the door of the building, allowed shaft to roll on his foot, jamming large toe.	322
F. Seigel		End of finger jammed while operating milling machine.	323
J. Fitzgerald		While working on an excavation, had his right leg broken below the knee, by a small portion of the earth falling on him.	324
John Wolfe	22	End of finger crushed by a casting.	325
Wm Carte	19	Right arm cut about one and one half inches long; a piece of steel flew and cut arm	326
Geo. Gala	22	Foot burned; some hot iron splashed on foot.	327
Thos. Donohue	58	Foot bruised; binder rollers fell on foot	328
S. Ohanus	26	Large left toe bruised while wheeling a load of spruce; it tipped over on foot.	329
John H. Shell	25	Thumb burst; struck thumb with hammer.	330
Thomas Wilson	17	Foot burned, while pouring iron some splashed on foot.	331
Christopher Eaton	30	Right arm cut and bruised; sleeve caught in shaft	332
Howard Gardner	21	Hand caught in apple grinder, taking his right arm off just above elbow	333
Aaron Mix	31	Second and third right fingers burned by some hot iron.	334
Joseph Parker	37	First and second fingers on right hand bruised while stamping dipper handles with a press	335
Dan Hogg		*Was going over to give the sawyer some assistance to cant the bolt, and standing in front of sawyer next to the circular, in some way he slipped and fell backward on the circular saw cutting him through to the ribs. He died next day	336
R. Wolfenden	22	Thumb off at first joint, first finger at second joint, and third finger at first joint, while ripping a board on rip saw.	337
Michael Lyon		Slightly injured	338
Arthur Lindsay	50	Struck on the head by a piece of emery wheel, making a cut as far as we can judge, two inches long.	339
John Toomey	29	Left side bruised by a bar slipping and striking side.	340
Fred Kempt	28	While handling a mower frame strained side.	341
John Forrest	21	While chipping a steel pin, a small piece of steel flew up and struck eye.	342
P. McGowan	36	Wrist strained while handling a heavy piece of wood	343
Chas McDonald		*While engaged sawing a piece of lumber, by some means got caught in saw and was thrown back, saw striking him in abdomen. He died June 2?th from result of injuries	344
Thomas Dyke	20	While putting rubber on die, did not throw belt off, and had foot on trip machine the third finger on left hand was taken off.	345
James Lingwood		Foot caught in elevator foot and leg slightly bruised.	346
W. T. Lobb		*Fell into a shallow pan containing acid from the shock of which he died	347
Wm Holmes	21	Three fingers crushed between chuck and spinning wheel.	348
Albert McWebb		While feeding material to a dado machine, in some manner his hand came in contact with knives, severing third and fourth fingers of left hand.	349
Mr. Fullerton		Finger crushed in lathe.	350
Hiram Walker	23	Bursted finger by a barrel of oil	351
Patrick Cudhaige	25	Three fingers cut across the back, struck on saw	352
Herb J. Spencer	28	Compound fracture of left leg below the knee while repairing steam nigger	353
Thos. Perrins	20	While using a hack saw, hand slipped and jammed thumb of right hand	354
Jas. Simmonds	36	Lost four fingers of right hand in a draw press.	355
Wm. Marrach	15	Received flesh wound on back of hand from wedge saw. He was brushing dust off table near saw	356
Frank Elliott	19	*He had bottle of liquor at mill, hidden near sawdust carriers into which he evidently fell while trying to hide the bottle. There is no question about his being dead before he was dropped in the incinerator.	357
Eugene Ranaud	26	*Was to remove cover from large digester for cooking pulp. He removed lid too quickly and escaping steam scalded him badly. Was removed to Victoria Hospital, Montreal, where he died from burns.	358
Jos. Severn	28	*Was to remove cover from large digester for cooking pulp. He removed lid too quickly and escaping steam scalded him badly. Was removed to Victoria Hospital, Montreal, where he died from shock	359
Wm. Maulder	21	Injured man was polishing grooved wheel when casting jammed and tore wheel to pieces, operator receiving cut in cheek and groin	360
A. Dunslow		While operating power shears got second and third finger of left hand under blade; fingers amputated about one-half inch from end	361
Antoine Hermader	21	*While running slash table he fell on one of the slash saws and was cut about back and fell into sawdust chute leading to slash box and was instantly killed	364
Thos. Marshall	18	Clothes caught on a shaft resulting in his arm being dislocated at shoulder, muscles torn and body bruised.	365
Henry Tanner	59	*Cut by band saw; caused death in thirty hours	366
Wm. E. Burke	23	First finger on left hand half nail cut off while forming sauce pan cover on a press	367
Arthur Hather	18	Injured in a press while putting stove-pipe sheets in it, cut on left hand between thumb and first finger.	368
Richard Price	15	Had first finger at first joint on right hand crushed while forming lantern hinges.	369
Andrew Ferguson	35	Truck load of timber being hauled past spot where he was working part of load fell off and struck him fracturing his leg	370

*Fatal

LIST OF ACCIDENTS

No	Date	Employer	Place.	Business.
371	Apr. 25	Rainy River Lumber Co.	Rainy River	Lumber mill
372	Aug. 1	"	"	"
373	" 14	A. R. Clarke Co.	Toronto	Gloves, mitts, etc.
......	June 9	The Pigeon River Lumber Co	Port Arthur	Lumber
374	July 11	"	"	"
375	Aug. 3	"	"	"
376	" 23	Kemp M'f'g Co.	Toronto	Metalware
377	July 4	The Goold, Shapley, Muir Co	Brantford	Windmills, etc
378	July 11	Brantford Screw Co	"	Bolts, screws, etc
379	July 7	Imperial Cotton Co	Hamilton	Cotton mill
380	July 10	International Harvester Co.	"	Harvest machines
381	July 10	"	"	"
382	July 6	Waterous Engine Works Co.	Brantford	Engines
383	June 30	The R. Forbes Co., Limited	Hespeler	Woollen goods
384	July 11	Kemp Manufacturing Co	Toronto	Metalware
385	July 11	"	"	"
386	July 15	The Riordan Paper Mills, Limited	Merritton	Paper mills
387	July 5	"	"	"
388	July 14	The Preston Furniture Co	Preston	Furniture
389	July 14	The General Brass Works Co	Toronto	Brass castings
390	July 24	Kemp Manufacturing Co	"	Metalware
391	July 28	"	"	"
392	July 22	"	"	"
393	July 26	International Harvester Co	Hamilton	Harvest machines
394	July 11	D. S. Perrin & Co	London	Biscuits, etc
395	July 17	The Knetchel Furniture Co.	Hanover	Furniture
396	July 19	Imperial Cotton Co.	Hamilton	Cotton mill
397	July 19	Metropolitan Soap Co	Toronto	Soap factory
398	July 11	T. E. Braine & Co.	"	Shirts, etc
399	July 24	Stratford Mill Building Co	Stratford	Machinery
400	July 17	The Hanover Portland Cement Co	Hanover	Cement
401	July 19	Canada Cycle & Motor Co	Toronto Junction	Motor vehicles
402	July 25	Grey & Bruce Portland Cement Co	Owen Sound	Cement
403	July 19	Thomas Organ & Piano Co	Woodstock	Organs and pianos
404	July 24	Massey-Harris Co	Toronto	Implements
405	July 21	Thomas Organ and Piano Co	Woodstock	Organs and pianos
406	July 29	Dolsen & McEwan	Blind River	Lumber
407	July 26	International Harvester Co	Hamilton	Harvest machines
408	July 21	"	"	"
409	July 14	"	"	"
410	July 21	John Dick	Seaforth	Jute bags
411	July 14	The Pedlar Metal Roofing Co.	Oshawa	Metal building material
412	July 14	The Rathbun Co.	Deseronto	Cedar mill
413	July 17	Canadian General Electric Co.	Peterborough	Electric works
414	July 17	Toronto Mill Stock & Metal Co.	Toronto	Paper stock, etc
415	July 13	The J. C. Scott Co.	Toronto	Pine and hardwood
416	July 17	"	"	"
417	July 27	The Rathbun Co	Deseronto	Lumber mills
418	Aug. 2	Gendron M'f'g Co.	Toronto	Children's vehicles
419	Aug. 7	The Rathbun Co.	Deseronto	Lumber mills
420	Aug. 2	Weston Shoe Co.	Campbellford	Shoes
421	Aug. 3	"	"	"
422	July 14	Old Homestead Canning Co	Picton	Canned goods
423	Aug. 11	J. R. Booth Lumber M'f'g.	Ottawa	Lumber
424	July 25	Canada Foundry Co.	Davenport	Foundry
425	July 31	The Gutta Percha & Rubber Co	Toronto	Rubber goods
426	Aug. 5	United Factories	Newmarket	Brushes
427	Aug. 7	Massey-Harris Co	Brantford	Implements
428	July 18	"	"	"
429	July 24	International Harvester Co	Hamilton	Harvest machines
430	July 27	"	"	"

FOR 1905.—*Continued.*

Person injured.	Age.	Particulars	No.
Gust Heggstrom	26	Part of load of lumber slipped from truck; bruised chest and crushed leg	371
Axel Anderson	22	Crushed between a load of lumber and end of a stick of large dimensions coming out of a machine; was badly bruised.	372
Frank Clifford	23	Finger caught in shaving machine.	373
Ellis Lindstrum	....	Was feeding conveyor; clothing caught in shafting, leg and collar bone broken.	....
Fred. Swan	..	Was thrown on saw by carriage and had left hand cut off.	374
• Stephen Zayne	.	Was straightening lumber on transfer; got his hand caught in gear, had to be amputated	375
Archie Harding	24	While putting sauce pan cover in lathe was cut across palm of left hand	376
H. Donald Dixon	28	Three fingers of left hand cut and torn on rip saw in wood shop.	377
Arthur Smith	..	Had finger severely sawed while operating a shaving and slotting machine	378
Bernard Cooper		End of finger cut off on spinning frame.	379
Samuel Stuart	18	Resin mill exploded, and burned his hands and face.	380
Albert Adams	32	Resin mill exploded, which caused him to fall from ladder on which he was working, bruising arm and side.	381
Joseph Bolton	24	Wheels lying against machine operated by him were knocked over injuring right foot	382
John Ward	19	Great toe crushed by loom beam dropping on it.	383
Rupert Goldering	15	Tip taken off second finger of right hand while cutting tops of can screws	384
W. E. Burk	23	Thumb of right hand cut on press.	385
Alex Wills	.	While at work in wood room, block of wood fell on right foot slightly injuring it.	386
Thomas Brick		While working on paper machine, clothing caught in roll, and he was carried around roller several times, breaking his right leg at ankle	387
Joseph Cluger	....	Right finger cut by rip saw.	388
David Wood	41	Arm cut by emery wheel.	389
Wm. Price	17	First and second fingers of right hand bruised in a press.	390
Joseph Donnelly	29	Bruised little finger and back of left hand while operating press	391
Herbert Trambly	25	Cut on left arm while operating spinning lathe.	392
Jesse Cooke	32	Eye punctured, nail flew up and struck eye.	393
Mona Condon	....	Nail of great toe crushed in platform of elevator.	394
D. Stradlebauer	....	Two middle fingers of right hand lacerated in knives of dado machine.	395
Walter Drewitt	..	Was engaged cleaning a loom while in motion bruising hand with pulley.	396
Vincent Nutter	.....	Slipped and spilled pail of hot soap over himself.	397
Arthur Dawson	14	Foot crushed in hoist.	398
Otto Hoelge	....	Put his hand in hub of wheel while in motion, and received several flesh wounds.	399
George Pringle	......	While operating cement conveyor, a quantity of cement struck him in the face injuring his eyes	400
Florence Alder	....	Top of index finger on right hand crushed in punch press.	401
William Minners	..	*Fell from scaffold while engaged in oiling and was killed.	402
Frank Bryson	18	Point of thumb cut on circular saw.	403
J. Beasley	.	Little finger and fleshy part of left hand cut on jointer.	404
Wallace Marshall	17	Thumb and forefinger cut on circular saw	405
Ed. Chelair	....	Collar bone broken, lever on circular carriage struck him	406
Thos. Johnson	35	Nail torn off finger, caught under machine.	407
John Selchow	65	Foot bruised by a machine falling on it.	408
Luigi Pacifici	45	Head severely cut; while taking binder from pile it fell and struck his head	409
George Brown	....	While adjusting a belt on pulley, pulley slipped off and struck him on knee	410
Percy Maud	30	Injured; was feeding sheets into metal lathe machine; greater portion of right hand was expanded and portion of fingers cut off.	411
Delbert Reid	18	Was operating shingle machine, and had second finger on left hand cut to the bone at middle joint.	412
J. Chatren	47	While adjusting a light at his machine slipped and fell about five feet on top of a pile of sheeting iron; arteries, muscles, and cords of left arm cut below elbow.	413
Alice McMann	13	Used hoist during lunch hour, right foot bruised.	414
John Stewart	...	Hand cut while setting up dado head.	415
Miles Walker	.	Toe crushed with radiator.	416
Charles Marchant	30	Accident on band saw, first, second, and third fingers cut off left hand and scapula bone of left shoulder split	417
Ed. Gilenas	64	Fell through opening in floor, sustaining injuries on back of head and left arm.	418
Clayton Pard	26	Band saw came in contact with sliver on log; saw was pulled off pulley cutting back of operator's hand when falling.	419
James Relles	18	Crushed off little finger of left hand in heel press.	420
Fred Rowe	19	Attempted to put on belt while shafting was in motion, and got left arm twisted in belt and broken a little above wrist.	421
M. Frederic		Was operating a pea threshing machine, and had hand taken off at wrist while attempting to remove some straw from gear in motion.	422
Wm. Goodyear	...	Passed to wrong side of circular saw in splitter mill, and in endeavoring to throw a slab over the top of the saw placed his arm on the saw. It was amputated above the elbow.	423
Tom Menzies	.	Had right leg broken while unloading steel girders from truck	424
Ernest Kemp	.	End of left thumb split while lifting hose mandril.	425
Mr Hopper	.....	Lost one finger of left hand while tinkering up a saw	426
Wm. Smuck	30	Heel of right foot injured while loading crate on wagon.	427
Wm. Gillespie	50	Injured by crate tipping about legs and feet.	428
Frank Byrne	30	Struck finger on emery wheel and had back of first right finger cut.	429
Wm. Platt	28	Right thumb and first right finger burst while removing a casting from under hammer.	430

LIST OF ACCIDENTS

No.	Date	Employer.	Place.	Business.
431	Aug. 9	International Harvester Co	Hamilton	Harvest machines
432	Aug. 15	United Factories	Newmarket	Brushes, &c
433	Aug. 21	The Morton Mfg. Co.	Hamilton	Tin cans
434	Aug. 23	"	"	"
435	Aug. 24	"	"	"
436	July 26	Hamilton Tool & Optical Co.	"	Machinery
437	Aug. 22	Canada Foundry Co	Toronto	Foundry
438	Aug. 6	International Harvester Co.	Hamilton	Harvest machines
439	Aug. 1	L. B. Denton & Co.	Woodstock	Castors
440	" 4	Canada Foundry Co	Toronto	Foundry
441	" 1	"	"	"
442	" 1	"	"	"
443	" 10	Krug Bros. & Co	Chesley	Furniture
444	" 11	D. S. Perrin & Co	London	Biscuits, etc
445	" 3	The Knechtel Furniture Co	Hanover	Furniture
446	" 14	Massey-Harris Co	Toronto	Implements
447	" 11	The R. W. Thompson Co	"	Mattresses
448	" 12	Canada Foundry Co	"	Foundry
449	" 31	Krug Bros. & Co	Chesley	Furniture
450	Sept. 2	Canada Cycle and Motor Co	Toronto Junction	Cycles, etc
451	Feb. [illegible]	The L. McBrine Co.	Berlin	Leather goods
452	Sept. 11	The McClary Mfg. Co	London	Stoves
453	" 12	Guelph Carpet Mills Co	Guelph	Carpet mill
454	" 12	The Ontario Sugar Co.	Berlin	Sugar
455	Aug. 1	The Rathbun Co	Deseronto	Lumber
456	" 4	"	"	"
457	" 26	A. R. Clarke & Co. Limited	Toronto	Gloves, etc
458	" 31	The Riordan Paper Mills	Hawkesbury	Paper mills
459	" 31	"	"	"
460	" 20	John Ritchie Co., Limited	Toronto	Knitting mill
461	Sept. 3	Raven Lake Portland Cement Co	Raven Lake	Cement works
462	" 7	The Cornwall Furniture Co	Cornwall	Furniture
463	Sept. 1	Imperial Cotton Co	Hamilton	Cotton mill
464	Sept. 6	International Harvester Co	"	Harvest machines
465	July 7	The National Table Co.	Owen Sound	Tables, etc
466	Sept. 26	International Harvester Co	Hamilton	Harvest machines
467	Sept. 7	"	"	"
468	Sept. 11	The Norton Mfg. Co	"	Tin cans
469	Sept. 21	International Harvester Co	Hamilton	Harvest machines
470	Sept. [illegible]8	International Harvester Co	Hamilton	Harvest machines
471	Sept. 18	"	"	"
472	Sept. 14	"	"	"
473	Sept. [illegible]	"	"	"
474	Aug. 29	The Lincoln Paper Mills Co	Merriton	Paper mills
475	Sept. 28	The Goold, Shapley & Muir Co	Brantford	Wind mills, etc
476	Sept. 2[illegible]	International Harvester Co	Hamilton	Harvest machines
477	Aug. [illegible]0	Kemp Mfg. Co	Toronto	Metalware
478	Aug. 28	The Parry Sound Lumber Co.	Parry Sound	Lumber
479	Aug. 30	Little Bros	Haileybury	"
480	Aug. 30	Little Bros	Haileybury	Lumber
481	Sept. 6	Rainy River Lumber Co.	Rainy River	"
482	Sept. 15	Rainy River Lumber Co	Rainy River	Lumber
483	Sept. 6	"	"	"
484	Sept. 1[illegible]	Rainy River Lumber Co	Rainy River	Lumber
485	Sept. 1[illegible]	"	"	"
486	Sept. 28	International Harvester Co	Hamilton	Harvest machines
487	Sept. 16	The Hanover Portland Cement Co.	Hanover	Cement

FOR 1905.—*Continued.*

Person injured.	Age.	Particulars.	No.
W. J. Agnew........	22	Wrist sprained by falling off shafting to ground.	431
Fred. Smith...... ..	14	Was loitering about rip saw, and had three fingers and thumb of one hand lacerated so that they had to be amputated.	432
Francis Barry......... ..	22	End of finger on right hand taken off in power press	433
J. Histed	22	Second finger of right hand caught in power press, with the result that nail was torn off and tip of finger cut	434
Stanley Walker....... ..	19	Two middle fingers of right hand partially cut off on machine which places the ends on cans.	435
Herbert Hilder	22	Index finger of left hand cut off at second joint on lathe gears	436
Wass Metro........... ..	....	Truck swung off track, crushing him between truck and beam	437
Geo. Burns..........	22	Left forearm broken; while putting on a belt it caught and flew off, striking arm.	438
Edna Thompson.....	16	Tripped press while finger was in die taking off top of right finger	439
Ed. Quinn....	. .	Was working as laborer and had right hand cut.	440
G. Woods	......	While working on riveting had eyelid cut by a rivet.	441
James Johnston..	...	Working as pitman; had small bone in right foot broken.	442
William Schildroth	....	While working on rip saw had left thumb cut off at first joint.	443
Aldwin Rockey.....	......	While taking scraps from cake machine caught foot between arm and end of frame, crushing large toe.	444
Hans Huenemoerder......	......	Lost part of three fingers of left hand while operating fitting saw.	445
James Irvine......	....	While trucking elevator case it slipped off truck and broke small bone of instep.	446
G. Long		Had tip of first left finger cut on trimming saw.	447
James Mannock....	. ...	Nail torn off third finger, hand caught in cutting machine.	448
Chas. Nowack.... . .	. .	Finger slightly injured on rip saw.	449
John Copeman	......	Second finger of right hand badly crushed while cleaning machine	450
Frederic Ackernecht ..	.....	Lost two fingers and thumb on a small rip of trim saw	451
William McDonald	18	Left forefinger taken off at the back of nail by leaving his foot on trip.	452
Mrs. White.... .	. . .	Belt slipped off a pulley and caught on coupling, wound around shaft and drew boom against her.	453
Frank Bracker.	37	Bones in hand injured by explosion of float	454
Will Spring.....	19	End of thump and first finger cut off on automatic saw.	455
Arthur Paul....	18	End of two fingers cut on hand re-saw machine.	456
Miss J. Pollard..... . .	15	Thumb of right hand crushed; skin caught in machine.	457
Baptiste Louge	18	*While engaged hoisting a square timber up one storey a rope was passed over a shaft while in motion loose end of rope entangled two of the men and drew him into shaft, breaking legs and skull from which he died.	458
Edmund Monette . ..	18	*While engaged hoisting a square timber up one storey a rope was passed over a shaft while in motion; loose end of rope entangled two of the men, and he was thrown against a beam containing a bolt, and was instantly killed.	459
Oscar Segsworth	....	Injured by being caught in a shaft.	460
John C. Force ...	20	Leg broken, foot caught between pulley and belt while trying to remove belt	461
Herman Runions.. .		The injury was sustained on a grooving saw, and it was necessary to amputate the forefinger back of middle joint.	462
Mary Hurst..		Small finger of right hand crushed while cleaning drawing frame.	463
Thomas Daly . .	21	Eye punctured while adjusting dies on press, punch struck edge of die and broke off a small sliver, which flew up and struck eye.	464
J. Logan	55	Small piece taken off one finger and one finger cut hand came in contact with trimming saw.	465
Peter Silzer	27	Right foot burned while pouring hot iron.	466
Joe Roman	28	Large and first right toe burned while pouring iron, ladle tipped.	467
John Patton.	16	While operating a power square shears, put left hand under the blade cutting off the pulp of tips of second and third fingers	468
F. Sobolwinski . ..	27	Second right finger burst, while packing in molding machine, some one struck hand with hammer.	469
John Hunt.. ..	19	First left finger burst, while handling a die, caught finger under end	470
W. Ledger .. .	24	Third right finger torn; slipped and fell against a machine	471
Jno. Marley . .	21	End of finger burst caught in a moulding machine.	472
Kate Searles ..	.	Finger smashed by being caught in the slide of spinning frame	473
Arthur Hurson .	16	Thumb on right hand cut off at first joint; caught hand between pair of rolls.	474
Sam. Potter... ...	18	Iron casting fell on left foot, crushing and breaking bone of big toe	475
Peter Sos	37	Leg severely burned from hip to ankle, while handling a ladle of hot iron	476
Leo Young	21	Thumb on left hand crushed at first joint, while punching oiler screws.	477
E. Williamson	23	Left arm crushed, caught in revolving gears of lumber rollers	478
Frank Pounder . .	35	*Not employed in mill, but was killed by boiler explosion when mill was on fire.	479
Chas. Dasermean . ..	23	*Not employed, but was killed by boiler explosion when mill was on fire	480
Linde McRae	25	Cut on face and general shaking up, a piece of babbit in steam-fed cylinder broke, carriage ran into buffers throwing him off	481
Wm. Marxin	35	Hand pierced by sliver at base of thumb, sliver flew back from lath saw	482
O. C. Deroche.... . .	19	Received a bad cut on shin, a piece of babbit in steam-fed cylinder broke carriage ran into buffers, throwing him off	483
A. Auleen	45	Saw-log which he was piling fell on his hand crushed one finger	484
Norman McRae	16	Leg lacerated stepped off platform on which he was working, falling on chain of overhead trimmer	485
Thomas Simmons	23	First left finger torn while piling mowers	486
John Bruder	32	Ankle bone of right leg broken; a chunk of clay fell on leg	487

* Fatal

LIST OF ACCIDENTS

No.	Date.	Employer.	Place.	Business.
488	August 23	The Gutta Percha and Rubber Co.	Toronto	Rubber goods
489	Sept. 8	Brown Teolin & Barr	St. Mary's	Lumber
490	Sept. 29	Massey-Harris Co.	Toronto	Implements
491	Sept. 13	The Journal Publishing Co.	St. Thomas	Printing, etc.
492	Sept. 26	The Elmira Felt Co.	Elmira	Felt goods
493	Sept. 18	Berlin Felt Boot Co.	Berlin	Boots, etc.
494	Sept. 23	"	"	"
495	Sept. 14	The Gutta Percha and Rubber Co.	Toronto	Rubber goods
496	Sept. 15	"	"	"
497	Sept. 28	Taylor Forbes Co.	Guelph	General hardware
498	Sept. 16	The Gibbard Furniture Co.	Napanee	Furniture
499	Sept. 16	Edwardsburg Starch Co.	Cardinal	Starch
500	Sept. 18	Canadian General Electric Co.	Peterborough	Electric works
501	Sept. 19	Canadian Colored Cotton Co.	Cornwall	Cotton mill
502	Sept. 20	Canadian General Electric Co.	Peterborough	Electric works
503	Sept. 21	"	"	"
504	Sept. 21	"	"	"
505	Sept. 22	"	"	"
506	Sept. 18	The Kennedy & Davis Milling Co.	Lindsay	Saw mill
507	Sept. 22	The Canada Wood Specialty Co.	Orillia	Hardwood flooring
508	Oct. 6	The Ottawa Car Co.	Ottawa	Car works
509	Oct. 6	"	"	"
510	Oct. 9	The Canadian Colored Cotton Co.	Cornwall	Cotton mill
511	Oct. 11	Canadian General Electric Co.	Peterborough	Electric works
512	Sept. 14	Rainy River Lumber Co.	Rainy River	Lumber
513	Oct. 6	"	"	"
514	Oct. 25	The Firstbrook Box Co.	Penetang	Packing Boxes
515	Oct. 11	The Canadian Portland Cement Co.	Marlbank	Cement
516	Oct. 12	The Rathbun Co.	Deseronto	"
517	Oct. 16	Belleville Portland Cement Co.	Belleville	"
518	Sept. 26	Tweed Brick and Tile Works	Tweed	Brick, etc.
519	Oct. 21	The Canada Carriage Co.	Brockville	Carriages
520	Sept. 23	Alex. Gordon	Malone	Shingle Mill
521	Oct. 23	The Rathbun Co.	Deseronto	Lath mill
522	Oct. 21	The Benjamin Mfg. Co.	Yarker	Carriage Wheels
523	Oct. 30	Canadian General Electric Co.	Peterboro.	Electric Works
524	Oct. 30	"	"	" "
525	Oct. 31	"	"	" "
526	Oct. 30	"	"	" "
527	Oct. 4	Canada Foundry Co.	Toronto	Foundry
528	Oct. 5	E. Leonard & Sons	London	Engines, etc.
529	Oct. 12	The Wm. Gray & Sons Co.	Chatham	Carriages
530	Oct. 13	The Columbia Handle and Lumber Co.	London	Lumber
531	Sept. 29	The Gutta Percha and Rubber Co.	Toronto	Rubber
532	Oct. 23	The Waterloo Mfg. Co.	Waterloo	Engines, etc.
533	Oct. 21	The Breithaupt Leather Co.	Berlin	Tanners
534	Oct. 25	Puritan Knitting Mills	Toronto	Knitting Mills
535	Oct. 27	The McClary Mfg. Co.	London	Stoves, etc.
536	Oct. 29	Thomas Bros., Limited	St. Thomas	Brooms, etc.
537	" 24	The Gutta Percha and Rubber Co.	Toronto	Rubber goods
538	" 31	The Gutta Percha and Rubber Co.	Toronto	Rubber goods

FOR 1905.—*Continued.*

Person injured.	Age.	Particulars.	No.
J. Wilson		Third finger of left hand crushed while cleaning calendar.	488
Chas. Mayle	28	Three fingers cut on saw while ripping a board	489
A. Rogers		While carrying a ladle of iron some splashed on shoe burning left foot and ankle.	490
Annie Coombs		While cutting some paper on paper cutter, operated by electricity, had her right hand on the lever and was straightening the paper with her left hand, beneath the knife, and turned around to see who came in the door, and let the lever go, causing the knife to sever her left hand at wrist.	491
Levi Brubacher		Four fingers of left hand taken off; came in contact with revolving cylinder of wool mixer.	492
John Bernofski		Compound fracture on the right arm, between elbow and shoulder; caught in belt on cylinder shaft.	493
John Howard	30	Arm taken off at elbow on burr picker machine.	494
W. Kingdom		Two first joints in the index finger of left hand taken off, while cleaning mill; hand was drawn into cogs.	495
M. Breeze		Left foot caught between elevator and floor; foot burst.	496
Wm. Thompson		Small finger on left hand cut off, and the next two fingers injured; laid his hand over circular saw while it was in operation	497
Geo. Sommers		Forefinger of left hand taken off at second knuckle on rip saw	498
Sam Burnside	25	First finger on right hand bruised on top joint, second finger badly bruised and third finger bruised on lower joint, while repairing box making machine.	499
Walter Iraish	34	While operating punch press, had index finger of left hand badly lacerated.	500
Christina Masson	14	Elbow fractured; slipped and fell down stairs.	501
John Sullivan	53	Nail of big toe of left foot almost pulled off; while lifting box off dray it fell on foot.	502
A. McMillan	27	Left foot bruised; while lifting angle plate it fell on foot.	503
A. Davidson	19	Index finger of left hand bruised and nail torn off; while removing piece of work from punch press.	504
Jos. Boseutcha	23	Hips bruised by cave in of an excavation.	505
Ernest Gilbert		Big toe of left foot cut off on re-saw machine	506
David Mark		*Was struck in the stomach by a piece of edging.	507
James Jackson	30	In-step burnt; while working on bull dozer, a spark fell from a welding heat.	508
John O'Boyle	33	Left hand torn while cutting off forging on steam hammer	509
Nettie Tyo	16	Lost second finger of left hand; caught hand between two gears in cleaning roving frame.	510
C. G. Morris	23	Three fingers of left hand badly lacerated and one finger taken off; while grinding tool, hand slipped against stone.	511
Paul Charboneau	25	Cuts and contusions on the head; was thrown across a conveyer by a board which he was straightening on the trimmer chains	512
Peter Peterson	40	Middle finger of right hand crushed by board flying back from rip-saw.	513
Clark Hopkinson	17	Thumb of right hand nearly severed by coming in contact with rip-saw	514
K. Guillaume	24	Left arm badly cut at the elbow and broken in the elbow by the breaking of a pulley.	515
Fred. W. Cooper	20	Flesh cut on face of thumb by rip saw	516
Geo. Calvin	35	Face injured; was hit with a hammer.	517
William Simpson		*Was caught between the corner of a brick machine and the revolving sweep, and was so seriously hurt that he died in a few days after accident.	518
Wm. Beattie		While oiling up machinery fell from ladder and injured his collar bone.	519
S. W. Hamilton		Reached over the shaft between balance wheel and saw to clean off saw-dust, and got caught by revolving shaft and had both feet taken off.	520
George McCoy	49	First and second fingers of right hand cut on saw.	521
Wm. F. Carl	28	*Clothing caught in auger and apparently choked to death.	522
John Wills	42	Index finger of right hand broken and third finger lacerated; while unloading slate slabs one fell, pinning hand between slab and truck.	523
F. Huppie	19	Second finger of right hand cut; casting fell on hand.	524
L. Hicks	20	Left thumb lacerated; steel clipping caught in hand.	525
W. Bongard		Second finger of right hand cut; hand caught between tool and lathe chuck.	526
R. Fraser		Flesh torn off second and third fingers of left hand.	527
R. R. Morris		Received a slight flesh wound in face.	528
Alexander Shaw		Struck in the eye by a small piece from board.	529
John O'Donnell		While running a bolting saw, a piece caught in the back of saw, inflicting a fracture of nose and contusion of the eye.	530
C. Gordon		While lifting a steel hose mandrel it slipped and jammed hand between mandrel and table.	531
John Bowman		While cleaning out the scrubber of this plant, forgot to close the gas off and was met with a blast of gas which overcame him for the time.	532
Robert J. Kingsley		Hand caught in leather wringer, causing the amputation of two middle fingers of left hand.	533
John McCann	16	*Was found lying on the elevator with his head crushed and dead. There was no person in the storehouse when accident happened	534
Charles Rose	24	Second finger of left hand pinched off between first and second joints in press room.	535
C. Berry	45	Three fingers of both hands lacerated; got his hands on jointer.	536
A. Dault	..	Caught hand under knife holders of slitting machine, cutting the back of hand to the tendons.	537
Geo. Bradley	..	While mining a batch of rubber, his left hand caught in the rolls, tearing the first three fingers.	538

* Fatal.

LIST OF ACCIDENTS

No.	Date.	Employer.	Place.	Business.
539	Oct. 18	United Factories	Toronto	Brushes, etc.
540	" 7	International Harvester Co.	Hamilton	Harvest machines
541	" 18	"	"	"
542	" 20	"	"	"
543	" 18	"	"	"
544	" 5	"	"	"
545	" 16	The Riordan Paper Mills.	Merritton	Paper mills
546	" 11	The Meaford Mfg. Co	Meaford	Furniture
547	" 20	"	"	"
548	" 24	International Harvester Co.	Hamilton	Harvest machines
549	" 20	"	"	"
550	" 20	"	"	"
551	" 24	"	"	"
552	" 24	"	"	"
553	" 6	"	"	"
554	Nov. 2	The Preston Furniture Co.	Preston	Furniture
555	" 4	Massey Harris Co.	Brantford	Implements
556	" 11	Winsor & Woodley	Toronto	Builders
557	" 13	The Riordan Paper Mills.	Merritton	Paper mills
558	" 14	International Harvester Co.	Hamilton	Harvest machines
559	" 2	"	"	"
560	" 1	"	"	"
561	Oct. 26	"	"	"
562	Nov. 20	Massey-Harris Co.	Toronto	Implements
563	" 14	International Harvester Co.	Hamilton	Harvest machines
564	" 17	"	"	"
565	" 17	Stauntons	Toronto	Wall paper
566	" 23	The Norton Mfg. Co.	Hamilton	Tinware
567	Nov. 26	The Norton Mfg. Co	Hamilton	Tinware
568	Nov. 27	Kemp Mfg. Co.	Toronto	Metalware
569	Nov. 29	The Fairgrieve Mfg. Co	Toronto	Metalware
570	Nov. 29	The Barrie Carriage Co.	Barrie	Carriages, &c.
571	Nov. 10	The John Bertram & Sons Co.	Dundas	Machine tools
572	Nov. 10	The John Bertram & Sons Co.	Dundas	Machine tools
573	Nov. 3	The Rathbun Co.	Deseronto	Cedar mill
574	Nov. 7	Canadian General Electric Co.	Peterborough.	Electric works
575	Nov. 1	The Sunlight Soap Co.	Toronto.	Soap
576	Nov. 9	The Wm. Hamilton Mfg. Co	Peterborough	Saw mill.
577	Nov. 4	The Ontario Malleable Iron Co	Oshawa	Malleable iron
578	Nov. 3	The Pedlar Metal Roofing Co	Oshawa	Metal roofing
579	Nov. 9	The Rathbun Co.	Deseronto	Cedar mill
580	Nov. 6	"	"	"
581	Oct. 31	The James Smart Mfg. Co.	Brockville	Stoves, etc
582	Nov. 13	The Rathbun Co.	Deseronto	Cedar mill
583	Nov. 15	The Canadian Locomotive Co	Kingston	Locomotives.
584	Nov. 15	The Canadian Locomotive Co.	Kingston	Locomotives
585	Nov. 11	Belleville Portland Cement Co.	Belleville	Cement
586	Nov. 11	The James Smart Mfg. Co	Brockville	Hardware
587	Nov. 18	The Ottawa Car Co.	Ottawa	Cars, etc
588	Nov. 14	The James Smart Mfg. Co.	Brockville	Hardware
589	Nov. 24	"	"	"
590	Nov. 17	Canadian General Electric Co.	Peterborough	Electric light
591	Nov. 10	John Briggs & Son	Brockville.	Woodwork-
592	Nov. 24	The Wm. Hamilton Mfg. Co.	Peterborough	Machinery.
593	Nov. 25	The Rathbun Co	Deseronto.	Sash, doors, etc
594	Nov. 28	J. H. Connor & Son	Ottawa	Washing machines
595	Nov. 23	The James Smart Mfg. Co.	Brockville	Hardware
596	Nov. 27	Belleville Portland Cement Co.	Belleville	Cement works.
597	Nov. 28	The Wm. Hamilton Mfg. Co	Peterboro	Machinists

FOR 1905.—*Continued.*

Person injured.	Age	Particulars	No.
H. Keene		Tip of thumb caught on saw.	539
Noble Berry	29	Left thumb bruised, struck thumb with hammer	540
H. Stockton	79	Left foot burned; some hot iron ran down shoe.	541
Louis Wood	16	First right finger badly crushed; caught finger between dies.	542
John Walton	30	Foot burned, hot iron splashed on foot.	543
Andrew Buda	25	Foot burned by some hot iron.	544
George Barge		Was at the top of the stairway on a level with the top of the digester when a volume of steam shot out, scalding his face, neck and arms.	545
Fred. Jncksch	55	Lost one finger and portion of thumb on shaper.	546
Mr Glover		Finger broken on re-saw.	547
Julius Ryl	24	Face cut under eye, struck in face with piece of iron.	548
P. J. McGowan	36	Right hand burned, caught hold of a red hot bar of iron.	549
Wm. Rosenburg	29	Left foot burned, some hot iron ran into shoe top.	550
Geo. Belgowan	68	Thumb severely torn on saw.	551
Lawrence Ryl	23	Leg and right hand burned, while carrying a ladle of hot iron.	552
Thomas Vanalstine	44	Arm broken and face cut; fell from ladder while oiling elevator motor.	553
Ward Rooke	16	Fingers hurt in the feed rolls of a sander.	554
David King		Right ankle strained by falling down an elevator well into the basement from the first floor	555
Alex. Foster	...	Thumb taken off while working on a jointer	556
Garfield Storin		Little finger and part of ring finger taken off, and the middle finger slightly torn, hand caught in calender rolls	557
Herbert O'Neil	21	While forming a piece of iron, struck iron with hammer, and a chip struck leg, puncturing it.	558
A. Doyle	55	Foot burned while shifting molds some hot iron splashed on foot	559
Thomas Hogg	29	Finger bruised; struck finger with hammer, while working at bench.	560
Wm. Miller	98	Septic wound in finger ran a piece of steel in it	561
Earl McConnell		Had first finger on right hand crushed between stripper and punch.	562
Steven Muirhead	40	Big toe of right foot burst; caught foot in elevator.	563
Steve Torok	21	Finger nail torn off; caught in moulding machines.	564
Robert Johnston	...	Hand badly bruised and two or more fingers cut; while loitering near a moving belt, hand came in contact with belt.	565
Harry Atkins	19	Index finger of left hand smashed to the first joint, while operating a bumping press.	566
Alfred Darby	24	While operating a power stamping press, caught thumb between the dies cutting about three-quarters of an inch off thumb.	567
Robert Breman	20	First finger of right hand cut at first joint by a trimming machine	568
Frank Rose		Part of finger taken off while playing with machine.	569
James Nelles	50	Third finger of left hand cut at first joint in buzz planer.	570
Richard Ball	40	Burnt by melted iron; metal had been poured into mould and by some means the metal strained through into damp ground below causing an explosion and throwing the metal on the men.	571
Daniel Laird	52	Burnt by melted iron, metal had been poured into mould and by some means the metal strained through into damp ground below causing an explosion and throwing the metal on the men	572
Peter Barnhardt	15	Third finger of left hand badly lacerated and second finger scratched on jointer.	573
R. Drury	38	Third finger of right hand amputated at first joint; caught finger between arbor and spider	574
Mary Heaps	15	Finger crushed in machine	575
Charles Wright	....	Toe broken while working at a punch in boiler shop.	576
Thomas Seville	42	*Leg broken while working in foundry, heavy iron plate fell on him He died from result of accident	577
Mr. Smith	..	Eye injured by a piece of steel flying from wrench	578
Amos Storey	33	Struck below the waist with spalt from shingle saw.	579
Alfred Goodman	50	Two or three ribs of left side broken, was rolling a log and slipped	580
Clinton Lennox	37	Large toe on right foot burned, spilled molten metal in boot	581
Harvey Stratton	60	Head and shoulders slightly hurt was knocked off cars	582
James Goodman	...	*Was crushed by the falling of a three ton cylinder which they were in the act of hoisting on to a boring machine He died from the injuries received	583
Robert Gorman	..	Was crushed by the falling of a three-ton cylinder	584
David Oliver Cobb	16	*While putting belt on shaft, the end of belt became fastened in pulley and he was drawn into shaft striking his head on plank, dashing his brains out.	585
Edward Lennox	14	While drilling pulley shells a shell broke and caught his finger, tearing nail off	586
Charles Hodge	27	While grooving a piece of oak on wood shaper the stop on gauge broke and hand went over saw, cutting top off three fingers of left hand	587
Walter Thompson	53	Palm of left hand badly cut, rusty nail caught hand	588
James Devine	14	Heel bruised, caught heel between elevator and floor	599
T. H. Byers	28	Little finger of right hand amputated at first joint, while bending press board had finger caught in machine	590
Wm Robinson	40	Bruised body; fell against a large pulley.	591
James Weise	..	Toe crushed; boiler plate fell on toe	592
Matthew Ryckman	22	Fell off step ladder dislocating wrist	593
Thomas Dewhurst	35	Shoulder blade broken; was caught between wagon and a pile of lumber	594
Frank Donohue	18	Thumb of left hand cut while running lathe, thumb of left hand got caught between tool and casting.	595
William Keller	38	Was knocked down and had leg broken by car body in which concrete is hoisted from the mixer to the body of the storehouse wall	596
James Gerard		End of third finger cut off while operating a jointing machine	597

* Fatal.

LIST OF ACCIDENTS

No.	Date	Employer	Place.	Business.
598	Dec. 4	The Dominion Cotton Co	Kingston	Cotton Mills
599	Dec. 24	The Knox Mfg. Co.	Toronto	Headwear
600	Nov. 10	The McClary Mfg. Co	London	Ranges, etc.
601	Nov. 17	D. L. Perrin & Co	"	Biscuits
602	Nov. 18	S. Allen	Norwich	Vinegar
603	Nov. 15	Thomas Bros.	St. Thomas	Brooms, etc.
604	Nov. 23	"	"	" "
605	Dec. 4	The McClary Mfg. Co.	London	Stoves, etc.
606	Dec. 13	E. Leonard & Sons	"	Engines, etc.
607	Dec. 24	The Knetchel Furniture Co	Hanover	Furniture
608	Nov. 13	Huntsville Lumber Co.	Huntsville	Lumber
609	Dec. 15	Rainy River Lumber Co	Rainy River	Lumber
610	Dec. 19	Kemp Mfg. Co	Toronto	Metalware
611	Dec. 3	Keenan Woodenware Mfg. Co	Owen Sound	Baskets, &c.
612	Nov. 29	Canada Foundry Co	Toronto	Foundry
613	Dec. 1	International Harvester Co	Hamilton	Harvest machines
614	Oct. 31	" " "	"	" "
615	Dec. 1	Stauntons	Toronto	Wall paper
616	Dec. 11	Lincoln Paper Mills Co.	Merritton	Paper mills
617	Dec. 15	Massey-Harris Co	Toronto	Implements
618	Dec. 20	United Factories	Toronto	Brushes, &c.
619	Dec. 19	The Canadian Colored Cotton Co	Hamilton	Cotton mills
620	Dec. 26	United Factories	Toronto	Brushes, &c
621	Dec. 7	R. McDougall Co	Galt	Boilers, &c.
622	Dec. 20	The Goold, Shapley & Muir Co	Brantford	Wind mills
623	Dec. 19	Imperial Cotton Co	Hamilton	Cotton mills
624	Nov. 30	Dunlop Tire & Rubber Co	Toronto	Rubber goods
625	Dec. 1	The James Smart Mfg. Co	Brockville	Hardware
626	Nov. 30	The Canadian Portland Cement Co	Deseronto	Cement
627	Dec. 14	Canadian Colored Cotton Co	Cornwall	Cotton mills
628	" 19	The Gendron Mfg. Co	Toronto	Vehicles, etc
629	" 14	The James Smart Mfg. Co	Brockville	Hardware
630	" 21	The Canadian Portland Cement Co	Marlbank	Cement works
631	" 16	The Gilmour Door Co	Trenton	Doors, etc
632	" 22	The James Smart Mfg. Co	Brockville	Hardware
633	" 23	" "	"	Hardware
634	" 30	Toronto Paper Mfg. Co	Cornwall	Paper mills
635	" 29	Canadian General Electric Co	Peterboro.	Electric works

FOR 1905.—*Continued.*

Person injured	Age.	Particulars.	No.
Martha Foster	17	Tip of middle finger of right hand crushed and end of index finger cut: fingers got between two gears	598
James Cumming	17	*Accidentally fell down elevator shaft, receiving injuries from which he died.	599
Chas. Jansen	21	Thumb and first finger on left hand crushed to first joint by a trip hammer	600
Gordon Brown	.....	Great toe squeezed in elevator	601
Mark Robinson	40	*Went inside of cider tank to clean it out and was overcome by carbonic acid gas and fell into the bottom of the tank; died within an hour after	602
Wm. Ferris	38	Thumb cut on shaper.	603
J. Hampton	40	One finger taken off; hand came in contact with saw	604
Harold Smart	17	First and second finger of left hand crushed above first joint while stamping ears; finger went under die	605
Geo. Morley	......	Two fingers broken by a face plate while operating lathe.	606
Valentine Luessing	......	Foot caught in elevator, bruising instep.	607
John Harbor	......	While edging in our saw mill a board was carried back by the saw, fracturing the flat bone of thigh	608
James Martin	25	Bruised about the stomach by a board thrown from saw.	609
Jos. McCoy	40	Big toe on left foot crushed while moving plate iron.	610
John Earnest	......	While erecting a supporting beam, it fell on him, breaking his leg.	611
J. Lamberton	......	Right hand smashed.	612
Theodore Dommer	27	Arm severely lacerated while grinding a knife.	613
Thomas O'Hearne	33	Thumb crushed while handling a machine, caught thumb under frame.	614
Ernest Barton	......	Eye severely cut, while wrestling fell on a moving pulley.	615
Wm. Webster	15	*Caught on a shaft and was killed while attempting to remove belt.	616
Steven Travis	......	While operating a boring machine sleeve of coat caught auger, drawing his left hand against set screw, tearing thumb.	617 618
Geo. Pepper	......	Two fingers cut on shaping machine.	
John H. Head	41	Forefinger of left hand broken and thumb cut by opening lid of picker before machine stopped.	619 620
Albert Cobbin	......	Was struck by a piece of wood from above while on the elevator.	
George Page	......	Hand caught in gears of a crane, losing part of one finger.	621
Wm. Miller	44	Heel of right foot and knee of left leg crushed by some iron blocks.	622
Jennie Lambert	......	Was struck by a shuttle, giving her a black eye.	623
Henry Brown	......	Finger crushed in a calender machine.	624
Andrew Stevenson	44	Cheek cut and back badly wrenched, fell off a box while reaching for tools	625
Thomas Coughlin	57	Back injured; wagon fell on him.	626
Harry Bulcock	14	End of finger taken off while playing with chain.	627
Jean Logeat	38	Slipped off a lumber pile, and sustained a cut in the forehead	628
Clinton Begley	21	Right foot badly burnt; while pouring mould, metal went through boot.	629
H. Hassaw	23	Left arm broken between elbow and wrist, caught in a belt.	630
S. A. Westfall	...	While cutting material for crating doors, lost ends of two fingers.	631
Chas. Howell	21	First finger of left hand cut, while working on milling machine, finger caught between tool and casting.	632
Donald Campbell	22	Left foot badly burned; hot iron splashed on it.	633
Duncan Grant	20	Fell from calenders; badly shaken up.	634
W. G. Hall	17	Face and hands burned; pulled wrong switch while testing electric apparatus.	635

* Fatal

REPORT

RELATING TO THE REGISTRATION OF

Births, Marriages and Deaths

IN THE

Province of Ontario

FOR THE

Year Ending 31st December,

1904.

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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LETTER OF TRANSMISSION.

To His Honour W. Mortimer Clark,

Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour,—

I herewith beg to present for your consideration the Thirty-fifth Annual Report of the Registrar-General, relating to the registration of births, marriages and deaths in the Province of Ontario during the year 1904.

Respectfully submitted,

W. J. HANNA,

Registrar-General of Ontario.

Sir,—I have the honor to submit for your approval and submission to His Honor, The Honourable William Mortimer Clark, Esquire, Lieutenant-Governor of Ontario, the Thirty-fifth Annual Report made in conformity with and under The Act respecting the Registration of Births, Marriages and Deaths in the Province of Ontario for the year ending December thirty-first, 1904.

I have the honor to be,

Sir,

Your obedient servant,

Chas A Hodgetts

Deputy Registrar-General.

Hon. W. J. Hanna,

Registrar-General of Ontario.

REPORT

TO

The Honourable W. J. Hanna,

Registrar-General of the Province of Ontario.

(1904)

BEING THE THIRTY-FIFTH ANNUAL REPORT.

SIR,—I have the honor to submit to you the following Report on the estimated population, and on the births, marriages and deaths registered in the Province of Ontario during the year 1904.

POPULATION.

Following the practice adopted in the report of last year, the population of the Province is estimated by geometrical progression. Estimated in this manner the population amounted to 2,203,968. The population of the cities of the Province has been computed separately this year upon geometrical progression as based on the census returns of the year 1901, and while thus estimated there is apparently a greater increase in this group than that estimated for the Province as a whole, yet the figures here given are more accurate than if the total increase was divided or apportioned to them. This increase of the population of the cities is not due so much to a birth increase as it is to an influx of population from the rural municipalities, yet for purposes of estimating the birth, death and marriage rates, these figures will give rates more accurate than under the method heretofore adopted.

BIRTHS.

The tables referred to in this paragraph are Nos. 1, 2, 3, 4, 5 and 6.

During the year 1904 there were registered 50,265 births, (including still births) being male and female infants which represents a birth rate of 22.8 per 1,000 of the population (Table 1), which is an increase of 0.7 per thousand over the preceding year and 1.1 per thousand over the registration of the year 1902. Although this birth rate is not as high as that of the Province of Quebec, yet must be considered satisfactory owing to the fact that a constant drain is taking place of young men of a marriagable age to the western provinces of the Dominion, where ultimately they settle down and marry thus materially reducing the numbers of that class of the population upon which an increase is dependent. The older couples; those who have passed the child-bearing period of life being left in Ontario, and considering further that it is not "the fashion" of the present day to have a family of more than one or two, the returns for 1904 must be looked upon as comparatively satisfactory, and we may feel thankful that the desire for the comforts and pleasures of a married life free from all "encumbrances" apparently is not making rapid headway in the community, and there are those

in our midst possessed with a due sense of their responsibility to the state and the benefits to be derived from a course of non interference with the laws of nature.

Births by Counties.—The returns of the forty-four counties will be found in Table No. 1. Of these, 33 show an increase over the returns of the preceding year—those with an increase of one hundred and over being, Bruce, 108; Essex, 117; Middlesex, 114; Northumberland and Durham, 111; Ontario, 189; Peterboro, 103: Thunder Bay 114; Wentworth, 149, and York, 344.

There still continue decreases in the births in the counties of Lanark, Prince Edward and Victoria, all three of which showed a decrease in 1903, but in the newer districts of the province, the birth returns show an increase over the preceding year, particularly is this the case in Thunder Bay District.

The seemingly high birth rates of Algoma, Haliburton, Nipissing, Parry Sound and Thunder Bay are no doubt due to the fact that the population figures are too low, many settlers having gone into these districts since the taking of the last Dominion Census.

Births in Cities.—The returns of the cities will be found in Table No. 2. These show a steady increase; this however may be more apparent than real from the fact the increase in population is often greater than that estimated and consequently the birth rate given is too high. Only in four cities was there a decrease in the number of births registered, viz.: Brantford, Windsor, Chatham and Woodstock.

Births in Towns of over 3,000 population.—This table, No. 3, is slightly altered from that of previous years, in that only those towns with a population of 3,000 and over are given—the 33 towns have an estimated population of 190,536—and the birth rate is 25.1 per thousand of the population or 2.3 per thousand in excess of the average for the province, and 1.9 in excess of the city group. The abnormal rate in some of these towns can be accounted for by an increase in population over that estimated, particularly in the case of the towns of Fort William, Peterboro and Port Arthur where the growth has been abnormal. The decrease of births in some of the towns is due to a movement of population consequent on changed commercial conditions, and is particularly noticeable in the case of Sault Ste. Marie.

Attention is again drawn to the fact that the birth rate in the rural districts is below the average for the province, the difference being the same as in 1903.

Births by Sexes and Months, &c., (Tables 4, 5 and 6).—The proportion of male births to female births has fallen from 105.8 in 1903 to 104.5 in the present year to 100 female births.

The month of November is that in which the fewest number of births occur whilst the maximum is reached in the month of May.

The number of twin births registered during the year has been 57 in excess of the number registered in 1903 and 26 more than in 1902, while of triplets 7 occurred during the year.

Births of Illegitimates.—The number of infants born out of wedlock numbered 798 or 15.8 in every 1,000 births registered. The total increase over 1903 being 16.

Marriages.

The tables referred to in this paragraph are Nos. 1, 2, 3, 7 and 8.

During the year 1904 there were registered 19,789 marriages, being 41 less than were recorded in the preceding year and equal to a rate of 8.9

per thousand of the estimated population, a rate which corresponds very closely to that of 1903 in which there had been a marked increase in marriages over the immediate preceding years.

The figures show that the rate of 1903 has been maintained. Of the total number of marriages, viz., 19,789, there were registered in the cities 6,618 or 33.4 per cent. 2,545 or 12.8 per cent. in the towns and the remainder 53.6 per cent. in the rural districts.

Marriages in Cities.—The returns for the cities were only 18 in excess of those registered in 1903. The rate per thousand of the population being 13.3 per thousand, or 4.4 per thousand in excess of the average for the whole province. The abnormal number of marriages registered in Windsor has again to be noticed—993 or 79.4 per thousand of the population—being greatly in excess of the returns of any other city or town.

Marriages in Towns.—The figures as given under this group of municipalities show that there has been an increase in marriages of 198 over the year 1903, and the rate is the same as the provincial average, 13.3. The most marked increases were those of Lindsay 41, and Peterborough 51. Of the decrease 78 in the town of Sault Ste. Marie is quite noticeable and is no doubt due to the financial difficulties of the most prominent industry, causing many to seek employment elsewhere.

Marriages by Months.—Fashion as well possibly as convenience still makes the leafy months of June dominant as that in which most marriages occur, indeed judging by the returns it is more popular than ever, while May still maintains the position at the foot of the list.

In grouping the returns by quarters it will be noticed that no change has occurred, and a preponderence of marriages take place in the last quarter of the year.

Marriages by Denominations.—A comparison with the returns for the year 1903, will show that no change has taken place in the order of precedence of the Religious Denominations as regards the number of persons of each sect married during 1904. The order being Methodists, Presbyterians, Church of England and Roman Catholic.

Deaths.

The tables referred to in this chapter are Nos. 1, 2, 3, 9, 10, 11, 12, 13, 14, 15.

The total number of deaths registered from all causes for the province was 30,920. divided as follows among the groups of municipalities:

Cities	8,742
Towns over 3,000 populations	3,364
Townships, including smaller incorporated towns and villages	19,284

The death rate for the province being 14.1 per thousand of the population, an increase of 0.7 per thousand over the rate for the year 1903.

The counties with a higher mortality rate than the average are, Carleton, Frontenac, Leeds and Grenville, Lincoln, Middlesex, Nipissing, Norfolk, Oxford, Perth, Peterboro, Prescott and Russell, Thunder Bay, Welland, Wentworth and York.

The lowest death rate recorded in that of Rainy River District, 10.8 per thousand, while the following counties follow very closely, viz., Grey and Lennox and Addington, 11.1 each. Huron, 11.3, Waterloo 11.5 and Algoma 11.8 per thousand. It will be noted that the death rate for the Rainy River District has increased from 7.9 in 1903 to 10.8, and a study of these returns confirms the theory advanced in the former report that the returns were incomplete.

Death in Cities.—Possibly the accuracy of the returns of the cities, together with the fact that the hospitals located therein for the care of the sick are made use of by the residents of the surrounding districts and the deaths which happen in these institutions are registered in the cities in which they take place, account in a great measure for the marked difference in the mortality of the cities as compared with the province generally. Added to these facts it must be remembered that the rapid growth of many of our cities leads to false deductions as regards birth and death rates, from the fact that our calculations are based on populations below those which actually exist. Taking these facts therefore into account we may safely consider that our cities are no worse than many of those to be found to the south of the boundary line, and considering the risks to life incident upon a city life that the cities of Ontario offer no particular dangers to this class of our population.

Deaths in Towns of 3,000 and over.—This table is slightly different from the former ones in that only towns with a minimum population of 3,000 are enumerated. The table comprises thirty-three towns with an estimated population of 190,536, the death rate being 11.8 per thousand, or 2.3 per thousand less than the provincial average. The municipality in this group with the lowest death rate is Goderich, where in a population of 4,196 only 46 deaths were reported, which is equalivant, to a death rate, of only 10.9 per thousand, which is lower than that recorded in 1903, viz., 13.8. It will be seen that there was a decrease of 12 in the number of deaths over the preceding year, in which year was an increase of 9 over that of 1902. This town is situated in the County of Huron, on the shores of Lake Huron at an altitude of 729 feet above the sea; of the 46 deaths, 5 were those of stillborn children which leaves 41 to be accounted for. Of this number 6 were under 6 months at the time of death, and of the remaining 35, the average age at death was 56, one being of the age of 92, 4 over 80 and 8 of years ranging from 70-80. Tuberculosis claims two—one aged 16 and the other 32.

The apparently high death rates of Fort William, 33.2; Port Arthur, 38.5; Toronto Junction, 38.5, are to be accounted for by the estimated population being largely below the actual population, and in the case of Fort William the increase is also due to the presence of enteric fevor there for some time, also to the fact that deaths occur in the hospitals of the two former towns amongst patients brought there for treatment from the surrounding district which is largely unorganized, as well as from the construction camps in the immediate vicinity.

The rate of 28.3 in the town of Hawkesbury corresponds with the high birth rate, and is due to the increased infantile mortality; of the 119 deaths, eleven were stillbirths, and of the remaining 108, 49 or 45.3 per cent. were infants of one year and under, and 18, or 16.6 per cent., were under 10 years of age, while at the other end of the age group, 12 deaths, or 11.1 per cent. were of persons over 70 years of age, the remaining 27 per cent. being between the ages of 20 and 70 as follows: Under 20, 2; under 30, 7; under 40, 8; under 50, 3; under 60, 8; with one who died of consumption whose age is not given. It will thus be seen that in this town alone there is much to be done along the line of the education of the parents, particularly the mothers, in the care and raising of infants, for many of the 49 deaths under one year I am certain could have been prevented if the parents had only known how to rear their babies.

Deaths in Counties during last ten years.—In table No. 9 will be found thr average death rate of each county for the past ten years together with

the death rate of each of the years since 1895. The average for the ten years is 12.5 per thousand which has been exceeded in 1897, 1899, 1900, 1901, 1902, 1903 and 1904, while making all due allowance for incompleteness of the returns of the early years of the decade yet I am of the opinion that the present average is too low, and the figures will gradually rise until the average of 1901, viz., 13.1 per thousand which was the census year will be exceeded. It will be seen that those counties in which are included the returns of the larger cities of the province, viz.: York, Wentworth, Carleton, Middlesex and Frontenac show a gradual upward trend in the yearly average rates. York having increased in the ten years from 13.2 per thousand in 1895 to 17.9, and Wentworth from 12.7 to 16.7, while Middlesex has increased from 9.6 to 15.2 and Frontenac from 11.2 to 14.2 per thousand in the same period of time. These counties show but slight change if any over the death rate recorded in the year 1895—for instance the following shows the rate in the former year and the average for the ten years.

County.	Percentage for 1895.	Average for ten years.
Brant	12.1	12.1
Elgin	10.2	10.9
Essex	12.0	12.7
Haliburton	10.7	10.8
Lincoln	13.1	13.7
Waterloo	10.1	10.9

These are counties in which the returns have been accurately made during the period, while on the other hand a study of the table will show the progress made in securing accurate returns as indicated by the figures.

Deaths by Age Groups.—To permit of comparison of the number of deaths at each of the several age groups, the table as submitted last year is again given with the addition of the figures for the year 1904.

Table of Deaths by Age Periods, 1897 to 1904, inclusive.

—	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60-69	70-79	80 and over	Not given	Total
1897	6,185	2,221	806	636	941	1,139	1,192	1,913	1,703	1,833	2,582	3,587	2,707	183	27,633
1898	5,975	1,992	761	518	830	1,072	1,013	1,790	1,631	1,865	2,713	3,429	2,635	143	26,370
1899	6,342	1,910	762	569	909	1,172	1,049	1,858	1,753	2,926	2,854	4,142	3,122	144	28,607
1900	5,174	1,989	803	563	941	1,257	1,083	1,908	1,819	1,937	2,949	3,825	3,099	164	29,494
1901	6,543	1,854	816	571	897	1,182	1,009	1,993	1,908	2,135	3,036	4,051	3,336	186	29,608
1902	6,003	1,984	826	571	791	1,078	937	1,941	1,927	1,785	2,916	3,636	3,085	264	27,864
1903	6,700	1,934	874	654	888	1,129	1,084	1,926	1,880	2,134	2,979	3,984	3,280	218	29,641
1904	6,907	1,612	655	552	865	1,205	1,188	2,025	2,033	2,254	3,280	4,518	3,911	285	30,290
Average	6,228	1,937	787	579	883	1,151	1,069	1,918	1,831	2,107	2,913	3,896	3,146	198	28,688

The total number of deaths for year was in excess of those registered in 1903 by 1,646. Of this increase, 207 were infants under one year of age, the chief increases were in the three age groups between 60 and 80 and over, no less than 89 per cent. of the total increase being in these aged persons, and the majority of these deaths were of persons of 80 and over, clearly indicating that there was in this year some reason for this mortality, while on the other hand the decreases were in the age groups from 1 year to under 20, the chief decrease being those persons of the ages under five and from 5 to 9, the groups influenced mostly by epidemic diseases.

Nativity.—The birthplace of 8,773 or 28.3 per cent. of those who died during the year is given as "foreign" and of this number 2,506 or 28.6 per cent. died as infants having only recently arrived from foreign countries, or

succumbed to the diseases incident to old age. The following are the figures in this connection taken from the returns of the past eight years as showing the relationship between the deaths of native and foreign born.

Year.	Total deaths.	Canadian born.	Foreign born.	Not given.
1897	27,633	19,610	7,675	348
1898	26,370	18,276	7,636	458
1899	28,607	19,644	8,509	454
1900	29,494	20,877	8,063	554
1901	29,608	20,788	8,245	575
1902	27,864	19,569	7,741	554
1903	29,664	21,039	8,135	490
1904	31,290	21,901	8,773	616

Social Conditions.—The number of married persons dying in the year was 49.9 per cent. being an increase 3 per cent. over those of the previous year, while 45.9 per cent. were unmarried. The remainder being returned as "not stated."

Deaths by Months.—As is usually the case in the month of June the smallest number of deaths is recorded while the maximim was reached in the month of March. And during the first quarter in the year 28.5 per cent. of the total number of deaths were registered, the minimum number being in the third quarter of the year. Considering the deaths by groups it will be found that the majority of deaths from communicable diseases occurred in the month of January, and the minimum during the month of school vacation, viz., July. To diseases of the nervous system were attributed the maximum number of deaths in the month of March, the minimum occurdeaths from diseases of the circulatory system, and the minimum in July, while diseases of the respiratory system were more fatal in the month of February, 476. The lowest number of deaths being recorded in August, viz., 85. In which month, however, the maximum number of deaths were reported as due to diseases of the digestive system, the minimum in November. The deaths due to accidents were more numerous in the months of July and August, corresponding with the holiday season, when boating and bathing are generally indulged in.

A study of the groups of diseases as adopted some years ago in accordance with an understanding arrived at with the representative of the boards of health, as well as with the federal authorities of the United States, shows that in the first group "Communicable Diseases" there are omitted several which might justly be now classed under this head, viz.: Pyaemia, septicaemia, malarial fever, tuberculosis, syphilis and epidemic cerebrospinal meningitis, for undoubtedly all of these diseases may justly be classed as "Communicable," the specific infection being communicated to the persons dying of them, and all of which it is well known are "preventible." To this group may very probably in the near future be added "cancer," pneumonia, and some forms of dysentery and diarrhoea. Mere reference is here made to the subject in order to indicate the incompletness of the present arrangement and the direction in which future rearrangement in the classification will possibly be made. Great assistance in the work will undoubtedly be derived from the bacteriological study of diseases.

At the present time it does seem strange to classify, alcoholism, diabetes and gout with tuberculosis, syphilis, and malarial fever, or even cancer,

under the head of "general diseases." However, to permit of ready comparison with other similar reports of vital statistics on this continent no change has been made to that agreed upon.

A Summary of the causes of Death.—In considering the causes of deaths it is found that 1,730 deaths were due to infectious or contagious diseases apart altogether from the deaths caused by tuberculosis and scrofula, which numbered 2,877.

The most fatal of the diseases in this group was diphtheria, 35.1 per cent. of the deaths in this group, being from this alone. The next in order was typhoid fever, with 27.8 per cent., and influenza, 19.1 per cent. Consequent upon the measures taken by local health authorities to prevent the spread of scarlet fever, which in 1903 had been prevalent and which caused 580 deaths in that year, the progress of scarlet fever was very much curtailed in 1904 and the diminished number of deaths, viz., 163, may be largely attributable to this cause, although in some districts of the province the mild character of the disease helped to bring about the improvement in the mortality rate.

The distribution of this class of diseases as shown by the death returns is most interesting. Peel County was apparently the only one free from that now common disease, typhoid fever, while the largest number of deaths were reported in York county, 56 of the 81, however, occurring in the City of Toronto. The newly settled districts of Thunder Bay and Nipissing, coming next in order. In the former district the chief trouble was in the town of Fort William, where the municipal authorities had permitted the conversion of one or two box drains, originally intended for carrying off surface water, into sewers, and the outlets of these drains being above the water intake, contamination of the public water supply occurred with the natural result of an outbreak of enteric fever. The conditions in Nipissing are no doubt largely due to the pollution of the wells, mostly surface wells, by seepage from yards, outbuildings and closets. As regards this disease it is particularly gratifying to note that in the Lake district, Muskoka, only four deaths were reported as due to typhoid.

The widespread character of diphtheria is evidenced by the fact that not a county or district in the province was free from it. The minimum number of deaths therefrom occurred in Oxford county, two being reported. The maximum number being in York, 160; it will however be seen on referring to table 14, that 127 of these were in the City of Toronto.

Attention is drawn to the widespread character of influenza, not a county or district but what has reported deaths from this disease, which since its appearance some years ago in pandemic form has been fatal, more particularly to those at the extremes of life, particularly the aged, not however, has it confined itself to these two classes, on the contrary, many of middle age have fallen victims to its debilitating influence, and if our death certificate required physicians to state thereon both the primary and secondary cause of death, I am satisfied many more deaths would be found attributable to this disease.

Tuberculosis.

To permit of comparison of the deaths per annum from this disease the table given in last year's report is continued. It will be seen that the total number of deaths for 1904 is 154 in excess of 1903. Every county and district lent its quota to make this large total.

Table showing the Number of Deaths from Tuberculosis in Ontario, from 1870 to 1904 inclusive.

Year.	Population.	Number.	Year.	Population.	Number.
1870	Not stated.	886	1889	2,148,981	2,417
1771	1,620,851	1,049	1890	2,161,971	2,503
1872	1,650,111	1,308	1891	2,122,716	2,379
1873	1,679,371	1,420	1892	2,146,020	2,592
1874	1,708,631	1,295	1893	2,167,460	2,552
No returns	1,737,891	....	1894	2,189,116	2,379
1876	1,767,151	2,315	1895	2,211,101	2,472
1877	1,796,411	2,188	1896	2,263,492	2,922
1878	1,825,672	2,053	1897	2,257,378	3,164
1879	1,854,931	2,104	1898	2,279,929	3,291
1880	1,884,200	2,197	1899	2,302,705	3,405
1881	1,923,610	2,446	1900	2,325,712	3,484
1882	1,923,610	2,591	1901	2,184,144	3,284
1883	1,923,610	2,667	1902	2,205,965	2,694
1884	1,923,610	2,506	1903	2,198,692	2,723
1885	1,923,610	2,499	1904	2,203,968	2,877
1886	2,115,971	2,573			
1887	2,115,971	2,556	Total		79,546
1888	2,148,971	2,551			

A comparison of deaths from tuberculosis in the cities and the counties in which these cities are situated and in which they are included in the general returns by counties shows that in the counties in which are situated the largest cities, the greatest percentage of deaths occur therein. Thus of the 439 deaths returned from the County of York, 338, or 77 per cent. took place in the City of Toronto, and, of the 135 deaths credited to the County of Wentworth, 101 or 74.8 per cent. occurred in the City of Hamilton. Similarly in Carleton County of 154 deaths from tuberculosis, 114 or 74 per cent. are found as occurring in Ottawa. In this latter city none of them could have happened outside the municipal limits, for the Division Registrar refuses to grant burial permits when a death from any cause occurs outside the city limits. The examples just quoted are the three largest cities of the province, and apart from the fact that some of the deaths may have been of persons having simply been attracted thereto by reason of the excellent hospital accommodation provided therein, although at the present time this argument has but little weight, for the hospitals refuse patients suffering from this disease. If even this argument is considered we find that the great majority of deaths in the counties of York, Carleton and Wentworth, happened in the cities, and the figures are of sufficient importance for the local health authorities to study the why and the wherefor, and if properly considered lead them to the adoption of active measures to stop this large death rate.

In what may be called the city group of counties, *i.e.*, those in which the cities are situated, there were 1,444 deaths from tuberculosis, or slightly over 50 per cent. of all the deaths happening in Ontario, while the estimated population of these counties was 1,037,011, or slightly under half the total estimated population—the deaths per 100,000 of the population were as follows:

(*a*) The whole province 1.30
(*b*) The city group of counties 1.39
(*c*) The non city group 1.23

A further study of these figures shows the death rate per hundred thousand of the estimated population of the city group to be as follows:

Brant, 101; Carleton, 157; Elgin, 90; Essex, 143; Frontenac, 153; Hastings, 117; Kent, 115; Lincoln, 155; Middlesex, 165; Oxford, 84; Perth, 89; Wellington, 99; Wentworth, 168; York, 158, from which is will be seen the counties with the larger cities have the highest mortality for this disease, the only exception being the County of Middlesex, in which the death rate exceeds that of any other county of the group excepting Wentworth.

In considering the non city group it is found that the minimum death rate per one hundred thousand of the estimated population occurs in the Rainy River district, the rate being 66, which fact may be accounted for by the district being recently settled and only the hardy of our settlers have gone into the districts. Of the old settled counties, Waterloo has the low rate of 67, with Norfolk, 71; Dufferin, 75; and Haldimand, 79, next in order—while those counties with an extremely high rate are found to be those bordering on the River St. Lawrence, Leeds and Grenville 193, and Stormont, Dundas and Glengarry, 213. The highest death rate is found in Thunder Bay District 228 per hundred thousand, but this can largely be accounted for by an influx of population, chiefly of a foreign character, and also a number of persons dying of the diseases being Indians. With the present lax medical examination of the immigration department of the Dominion Government we cannot expect now arrivals at our ports suffering from this disease to be detected. The result is they go west and living often in the most unsanitary conditions in this extremely western portion of our province, soon become victims of a disease of which I too often fear they have been the sufferers before leaving their European homes. A study of the returns shows that eleven out of the total of 29 were of foreign birth and seven were Indians, wards of the Dominion Government. We thus have only 11 deaths of native born persons which gives a death rate of only 86 per hundred thousand.

The death rate of Muskoka, 155 per hundred thousand of the population, would indicate that deaths occur of persons suffering from tuberculosis who seek this section of the province with the hope of being benefited, but succumb to the disease before being able to return home.

Deaths from Cancer.—The number of deaths from the various forms of cancer were 1,253, being 97 in excess of the previous year. Its distribution was general over the province, not a county but what recorded deaths from either carcinoma, sarcoma or other malignant growths.

Diabetes.—No deaths from this disease were reported in the District of Algoma, and the Counties of Brant, Bruce, Dufferin, Elgin and Essex—with these exceptions this disease would appear to be found generally throughout the province.

Diseases of the Nervous System.—The total number of deaths under this group, 3,694, being 405 in excess of 1903 and representing 11.8 per cent. of the total deaths from all causes. The increases are as follows: Encephalitis, 67; simple meningitis, 133; congestion and haemorrhage of the brain, 72; softening of the brain, 22; paralysis, 203; convulsions (not puerperal), 10. While the decreases are found under epidemic cerebro-spinal meningitis, 26; insanity, 6; eplipsy, 23; and other nervous diseases, 37. The number of deaths from nervous diseases reported in the cities was 1,207 or 27.5 per cent. of the provincial total, and with the exception of the group which includes diseases of old age and infancy, there were more deaths from these diseases than from any other group cause, the death rate in the cities being 207 per hundred thousand of the population. The general conclusion

to be drawn from the figures is that nervous diseases are on the increase in the province. The number of infants dying under 1 year in this group is 645, and 271 between 1 year and under 5, representing nearly one-quarter of the whole.

Diseases of the Circulatory System.—The number of deaths due to diseases of this system was 2,367, a slight decrease, 123, in the returns of the preceding year. The greatest number of deaths occurring in any one month was in March, when 269 were reported, with January a close second, having 267 to its credit, and it will be seen that these are the same two months in which the largest number of deaths happened from diseases of the respiratory system. The minimum, 180, being found in the month of September, which also corresponds with the minimum of deaths from diseases of the respiratory system. The great disparity between the social conditions of those succumbing to this class of diseases is noticeable, 492 of the total of 2,367 being unmarried, and of this number 161 were under 19 years of age. Of the total number of deaths, 1,331 were of the age groups of 60 and over, and 75 per cent. of the total were ascribed to organic diseases of the heart.

Diseases of the Respiratory System.—The total number of deaths in this group is 3,252, being a slight decrease 36, as compared with the year 1903. As stated in the foregoing paragraph, the maximum number of deaths occurred in the month of March, the month perhaps of greatest variations in temperature, the minimum being reached in September. Of the total number of deaths 1,738 or 53.4 per cent. were caused by pneumonia. Turning again to the infantile mortality we find that 625 were under one year and 966 under 5 years of age, or close on 30 per cent., while in the age groups, 60 and over, 1,331 deaths occurred, or 40.9 per cent., clearly indicating the severity of this class of diseases upon the extremely young and those advanced in years, the two groups together claiming 70 per cent. of all the deaths in the group.

Diseases of the Digestive System.—This important group includes not only the diseases of the stomach and alimentary canal, but also includes diseases of the liver and troubles of a surgical character, as appendicitis, hernia and iliac abscess. The total number of deaths was 2,594 of which nearly one-third (852) were infants under 1 year, nearly all of whom must have succumbed to infantile diarrhoea, for 1904 deaths were attributable to this disease. In what may be termed the surgical sub group we find that 174 died of hernia and intestinal obstruction, 333 of peritonitis, and 268 of iliac abscess and appendicitis. Unfortunately the records do not show definitely in how many of the above 775 instances surgical measures were resorted to previous to death, or how long after operation death took place.

Diseases of the Genito-Urinary System.—In this group 1,175 deaths are tabulated, 1,001 of which were due to diseases of the urinary system alone, the remainder being classed under diseases of the genitalia, 22 being male and 152 female. Of the 1,009 deaths attributable to diseases of the urinary system, 185 were from acute nephritis, and 523 from "Bright's Disease."

Deaths from Puerperal Diseases.—The deaths in this class number 274, being almost equally divided between each of the four diseases constituting it.

Malformations, Diseases of Infancy, Old Age, etc.—To this group there must ever be attached the interest associated with the rendering of life's harpsichord both before it has begun to vibrate and after it has lost its tension and tune. The number of "still births" keeps steadily mounting upward.

If the causes were all natural one would not perhaps, think so much of it, but when the tendency of the present day is for families on the permanent unit basis without any intention of extension on this basis, or what is worse still and more criminal, it is in many instances the avowed purpose of our young people entering the married life with the expressed intention of remaining free from family duties and responsibilities. With these facts in view and also having a belief that the sexual instincts are still strong in our vigorous Canadian race, it is with feelings of mingled alarm and remorse I direct attention to this steady increase in still-births in our province. Of the total number, 1,690, the cities returned 546, the towns 86, the remainder having occurred in the rural districts.

Of the deaths from senile decay there were 3,411. Of the counties outside the city group the greatest number of deaths occurred in the following counties: Grey, 158; Leeds and Grenville, 142; Northumberland and Durham, 179; Simcoe, 151, and Stormont, Dundas and Glengarry, 158.

Suicides nad Accidents.—Of the former there were 113; of these, 77 were males and 36 females, 40 single and 65 married; in 8 instances the social condition was not known. The youngest suicide was under 14 and the oldest was over 80. The accidents happening in the province shows an upward tendency, the figures showing an increase for the year of 16 over 1903. Of the deaths, 1,050 were males and 258 females, while no period of life is free from deaths by accidents, we find the maximum is reached in the age group 20 to 24, and the minimum is that third or fourth years of child life. It is peculiar to note that not a death occurred as the result of a bicycle accident, and despite the extension of the electric railway system only 19 deaths were due to this cause. The record of 219 deaths by drowning is a strong plea for the systematic teaching of swimming to our school children, and the 186 deaths by railway accidents might be used as an argument that pedestrians and the public of this province have some claim to a right of way and a better protection should be given us at our level crossings. The value to the province of the 186 lives lost under this head in 1904 represents a sum which might have been saved if such restrictions were better enforced.

In conclusion I beg to append the report of the chief clerk upon the office work of the department. The work of the clerks both individually and collectively has been well and willingly done, and to their carefulness the accuracy of the tables is in the main due.

Owing to the fact that the report of the meteorological services of the Dominion has not yet been published, I am unable to give a resume of the weather report of the year 1904.

I have the honor to be,

Sir,

Your faithfully,

CHAS. A. HODGETTS,

Deputy Registrar-General.

REPORT OF CHIEF CLERK.

Toronto, May 29th, 1906.

To Chas A. Hodgetts, M.D.,

Deputy Registrar-General of the Province of Ontario.

Sir,—I have the honor to submit for your consideration the following statement showing the work done by the staff of the Registrar-General's Department, during the year 1905.

Receiving and entering the returns from about 800 Division-Registrars and issuing 1,600 certificates therefor, addressing and mailing 1,600 semi-annual notices.

Indexing.

Births indexed, (left over from last year)	21,000
Births (1904), indexed	44,000
Births (1904), not indexed, 6,265.	
Marriages (1904), all indexed	39,578
Deaths (1904), indexed	17,000
Deaths (1904), not indexed, 14,290.	
Total	121,578

Comparing.

Births compared, (left over from last year)	48,642
Births (1904), compared	27,500
Births (1904) to be compared	22,765
Marriages (1904), all compared	39,578
Deaths (1904), compared	16,500
Deaths (1904), not compared, 14,790.	

In all 17,120 marriages have been indexed this year from old County Register books of dates prior to 1869, which have lately been received by this department.

The total number of marriage license cards received from issuers up to June last, when the new marriage license regulations came into force, was about 6,400. Since that date these cards have been displaced by affidavits from issuers, on the back of which the card details are given; of these about 9,000 have been received and filed by counties, up to the end of the year.

Under the new regulations all marriage licenses are now sent to this department where they are filed by counties; from June last to the 31st of December, about 6,400 have been received from clergymen and an official receipt made out and mailed on receipt of each license.

All license cards and affidavits giving similar information, are sorted by counties and compared with the index book of marriages. About 800 of these marriages were found unregistered by the officiating clergymen, who were notified by letter, and this year nearly 500 additional returns have been secured and registered by this system.

This work required some 1,200 letters to be sent and replies received.

Over 300,000 blank forms are sent out yearly to some 800 division registrars, and 1,800 issuers of marriage licenses.

During this year 483,361 registrations of births, marriages and deaths have been compared, which were indexed prior to 1902, when yearly comparing was adopted and added to the work of the Registrar-General's staff.

Compiling annual report and preparing special tables for same. Wrapping, addressing and mailing 6,400 copies to senators, members of parliament, physicians, clergymen, judges, school officials and foreign exchanges, which takes 3 clerks several months each year to complete.

CIRCULARS.

Circular letters addressed and mailed as follows:

To clergymen	2,600
To issuers of marriage licenses	4,600
Total	7,200

Searches have been made and certificates issued during this year, for applicants, as follows:

1,516 searches for births, marriages and deaths, at 25 cents.	$379 00
324 certificates for births, at 50 cents	162 00
134 certificates for marriages, at 50 cents	67 00
352 certificates for deaths, at 50 cents	176 00
Total	$784 00

40 books averaging 600 pages, being records received from division-registrars of births, marriages and deaths have been examined and arranged by counties for binding.

All of which is respectfully submitted.

GEORGE WHELER,
Chief Clerk.

TABLE NO. 1.

Table showing the total number of Births, Marriages and Deaths in each County in 1904.

Counties.	Population.	Births.			Marriages.			Deaths.			Totals.			Ratio to 1,000 of the population.		
		Number in 1904.	Variation from 1903. Increase.	Variation from 1903. Decrease.	Number in 1904.	Variation from 1903. Increase.	Variation from 1903. Decrease.	Number in 1904.	Variation from 1903. Increase.	Variation from 1903. Decrease.	Number in 1904.	Variation from 1903. Increase.	Variation from 1903. Decrease.	Births.	Marriages.	Deaths.
Algoma	45,803	1,441	10	.	401	...	76	541	...	28	2,383	....	96	31.4	8.7	11.8
Brant	38,486	781	28	....	271	..	69	513	71	...	1,565	30		20.2	7.0	13.3
Bruce	59,556	1,300	108		417	.	43	735	..	22	2,452	88	.....	21.8	7.0	12.3
Carleton	97,784	2,281	6		831		2	1,627	...	73	4,739	....	63	23.3	8.4	16.6
Dufferin	21,228	453	....	7	160	.....	30	269	27		882	.....	10	21.3	7.5	12.6
Elgin	43,981	785	45	......	353	....	7	586	106		1,724	144	..	17.8	8.0	13.3
Essex	59,047	1,602	117	......	1,595	....	80	784	17		3,981	..	180	27.1	27.0	13.2
Frontenac	44,939	899	79		349	.....	21	640	..	84	1,888	....	32	20.0	7.5	14.2
Grey	70,221	1,519	94		516	3	...	880	79		2,945	176		21.6	7.7	11.1
Haldimand	21,427	420	41		189	1		266	56		875	78		19.6	8.8	12.4
Halton	19,722	407	38		134	21		273	43		814	120		20.6	6.8	13.8
Haliburton	6,618	233	47	.....	50	8	...	81	1	.	364	56	...	35.2	7.5	12.2
Hastings	59,828	1,229	42	.....	461	.....	48	728	18		2,418	12	......	20.5	7.7	12.1
Huron	62,381	1,121	.....	35	428	....	6	710	19		2,259	......	23	17.9	6.8	11.3
Kent	57,944	1,174	.....	74	453	.....	32	742	70	.....	2,369	......	36	20.2	7.8	12.8

Lambton	57,156	1,136		12	479	17		701	9		2,319	14		19.8	8.3	12.3
Lanark	37,570	715		23	274	11		510	64		1,499	62		19.0	7.2	13.5
Leeds and Grenville	59,532	1,140	59		452	5		906	9		2,498	75		19.1	7.6	15.2
Lennox and Addington	23,558	410		26	186	6		263		5	857		26	17.4	7.8	11.1
Lincoln	30,829	567		49	232	9		488	98		1,287	58		18.3	7.5	15.8
Middlesex	93,544	1,917	114		804		13	1,427	142		4,148	242		20.4	8.5	15.2
Muskoka	21,162	643	7		183	17		281	31		1,107	55		30.3	8.6	13.2
Nipissing	26,983	1,321	11		259		33	502	23		2,082		23	48.9	9.5	18.6
Norfolk	29,411	591	84		213		20	421	79		1,225	143		20.0	7.2	14.3
Northumberland and Durham	62,612	1,169	111		454	32		842		14	2,465	130		18.6	7.2	13.4
Ontario	40,775	958	189		290		15	526	31		1,774	201		23.4	7.1	12.9
Oxford	48,844	976	12		362		5	711	65		2,052	70		19.9	7.4	14.6
Parry Sound	25,163	771	5		156	39		311	51		1,238	35		30.6	6.1	12.3
Peel	21,670	328		49	165	12		288	20		781		19	15.1	7.6	13.2
Perth	50,323	1,034	56		386	1		550		70	1,970		12	20.5	7.6	18.9
Peterboro	36,393	891	103		337	7		552	13		1,780	123		24.4	9.2	15.1
Prescott and Russell	47,746	1,775	51		358		17	704		80	2,837		47	37.1	7.4	14.7
Prince Edward	18,026	270		3	124		20	231		8	625		25	14.9	6.8	12.6
Rainy River	16,590	343	16		111	19		180	49		634		84	20.6	6.6	10.8
Renfrew	53,190	1,465	38		400		3	644	5		2,508	36		27.5	7.5	12.1
Simcoe	83,063	1,937	64		660		20	1,057	23		3,654	67		23.3	7.9	12.7
Stormont, Dundas and Glengarry	69,555	1,581	63		470		23	952	158		3,001	197		22.7	6.6	13.6
Thunder Bay	12,660	493	114		198	39		329	76		1,020	228		38.9	15.5	25.0
Victoria	32,242	648		63	301	77		391		12	1,340	2		20.0	9.3	12.1
Waterloo	53,070	1,190	42		451		3	613	14		2,251	53		22.4	8.4	11.5
Welland	31,874	661		15	354	12		502	51		1,517	48		20.7	11.1	15.7
Wellington	56,150	1,086	32		412		39	755	47		2,243	30		19.3	7.3	13.4
Wentworth	80,173	1,752	119		772	47		1,341	169		3,865	365		21.8	9.6	16.7
York	275,139	6,852	344		3,308	264		4,931	244		15,091	853		24.9	12.0	17.9
Totals	2,203,968	50,265	2,319	356	19,789	647	625	31,290	1,978	396	101,344	3,791	676	22.8	8.9	14.1

TABLE NO. 2.

Table showing the total number of Births, Marriages and Deaths in each City in 1904.

Cities.	Population.	Births. Number in 1904.	Births. Variation from 1903. Increase.	Births. Variation from 1903. Decrease.	Marriages. Number in 1904.	Marriages. Variation from 1903. Increase.	Marriages. Variation from 1903. Decrease.	Deaths. Number in 1904.	Deaths. Variation from 1903. Increase.	Deaths. Variation from 1903. Decrease.	Totals. Number in 1904.	Totals. Variation from 1903. Increase.	Totals. Variation from 1903. Decrease.	Ratio to 1,000 of Population. Births.	Ratio to 1,000 of Population. Marriages.	Ratio to 1,000 of Population. Deaths.
Toronto	216,837	5,286	245	.....	2,867	236	...	3,886	151	.....	12,039	632	....	24.3	13.2	17.8
Hamilton	53,789	1,205	98	.....	599	18	.....	928	116	.....	2,732	232	.....	22.4	11.1	17.2
Ottawa	65,679	1,597	42	.....	588	....	3	1,234	.....	29	3,419	10	....	25.8	8.9	18.7
London	39,993	943	115	.....	457	2	....	690	63	.....	2,090	180	....	23.5	11.4	17.2
Kingston	18,124	390	46	.....	187	.....	25	360	.....	18	937	3	....	21.5	10.3	19.8
Brantford	17,993	429	.....	23	151	.....	53	273	43	.....	853	....	33	23.8	8.3	15.1
St. Thomas	11,603	235	30	.....	134	.....	12	173	26	.....	542	44	.....	20.2	13.2	14.9
Guelph	11,800	270	33	.....	119	.....	6	169	.....	11	558	6	.....	22.8	10.0	14.3
St. Catharines	10,191	193	4	.....	105	.....	6	199	48	.....	497	46	.....	18.9	10.3	19.5
Belleville	9,200	167	3	.....	90	.....	15	173	2	.....	430	.....	10	18.1	9.7	18.8
Stratford	10,101	233	41	.....	109	18	....	116	.....	48	458	11	.....	23.0	10.7	11.4
Windsor	12,763	290	.....	29	993	.....	97	195	5	.....	1,478	.....	121	22.7	79.4	15.2
Chatham	9,073	156	.....	12	147	.....	7	156	23	.....	459	4	....	17.1	16.2	17.1
Woodstock	8,900	159	.....	26	72	.....	32	190	47	.....	421	.....	11	17.8	8.9	21.3
Total	496,046	11,553	657	90	6,618	274	256	8,742	524	106	26,913	1,168	175	23.2	13.3	17.6

TABLE NO. 3.

Table showing the total number of Births, Marriages and Deaths in Principal Towns of over 3,000 population during 1904.

Towns.	Population.	Births. Number in 1904.	Births. Variation from 1903. Increase.	Births. Variation from 1903. Decrease.	Marriages. Number in 1904.	Marriages. Variation from 1903. Increase.	Marriages. Variation from 1903. Decrease.	Deaths. Number in 1904.	Deaths. Variation from 1903. Increase.	Deaths. Variation from 1903. Decrease.	Totals. Number in 1904.	Totals. Variation from 1903. Increase.	Totals. Variation from 1903. Decrease.	Ratio to 1,000 of Population. Births.	Ratio to 1,000 of Population. Marriages.	Ratio to 1,000 of Population. Deaths.
Arnprior	4,191	125	......	......	42	2	......	52	12	......	219	......	30	29.8	10.0	12.4
Barrie	6,074	110	16	......	81	3	......	91	......	14	282	5	......	18.1	13.3	14.9
Berlin	10,576	245	17	......	119	......	14	131	1	......	498	4	......	23.1	11.2	12.7
Brockville	8,985	230	28	......	102	27	......	170	......	30	502	25	......	25.5	11.3	18.9
Carleton Place	4,098	88	1	......	38	......	6	49	......	6	175	......	11	21.4	9.2	11.9
Collingwood	6,025	180	......	23	49	......	30	101	......	4	330	......	57	29.8	8.1	16.7
Cobourg	4,279	78	......	8	39	11	......	78	......	4	195	2	......	18.2	9.1	18.2
Cornwall	6,765	160	9	......	73	17	......	133	8	......	366	34	......	23.6	10.7	19.6
Fort William	4,035	206	25	......	93	25	......	134	29	......	433	79	......	51.0	23.0	33.2
Galt	7,968	149	8	......	84	13	......	126	15	......	359	36	......	18.7	10.5	15.8
Goderich	4,196	79	21	......	33	......	4	46	......	12	158	5	......	18.8	7.8	10.9
Ingersoll	4,616	93	......	12	51	11	......	91	......	8	235	......	9	20.1	11.0	19.7
Kenora	7,145	138	12	......	50	15	......	98	35	......	286	62	......	19.3	6.9	13.7
Lindsay	7,306	152	......	5	121	41	......	118	32	......	391	68	......	20.8	16.5	16.1
Napanee	3,172	53	6	......	60	......	3	37	......	17	150	......	14	16.7	18.9	11.6
Niagara Falls	4,284	156	50	......	143	28	......	101	48	......	400	126	......	36.4	33.3	23.5
Orillia	4,942	101	12	......	92	11	......	69	19	......	262	40	......	20.4	18.6	13.9
Oshawa	4,436	139	40	......	59	17	......	76	22	......	274	79	......	31.3	13.3	17.1
Owen Sound	9,201	137	......	78	128	23	......	185	58	......	450	3	......	14.8	13.9	20.1
Paris	3,259	71	16	......	42	2	......	58	2	......	171	20	......	21.7	12.8	17.7
Pembroke	5,407	147	......	11	64	18	......	106	10	......	317	17	......	27.1	11.8	19.6
Perth	3,620	74	......	26	38	......	17	51	6	......	163	......	37	20.4	10.4	14.0
Peterboro	11,741	353	99	......	199	51	......	247	71	......	799	221	......	30.0	16.9	21.0
Petrolia	4,173	83	......	7	40	......	3	52	8	......	175	......	2	19.8	9.5	12.4
Picton	3,731	52	19	......	43	......	21	61	4	......	156	2	......	13.9	11.5	16.3
Port Arthur	3,244	144	31	......	86	11	......	125	23	......	355	65	......	44.3	26.5	38.5
Port Hope	4,227	85	8	......	52	......	3	72	......	5	209	......	......	20.1	12.3	17.0
Sarnia	8,682	213	32	......	180	22	......	154	19	......	447	......	27	24.5	20.7	17.7
Sault Ste. Marie	9,937	217	......	60	122	......	78	115	51	......	484	......	192	21.8	12.2	11.5
Smith's Falls	5,621	86	10	......	50	......	3	71	14	......	207	21	......	15.3	8.8	12.6
Toronto Junction	6,146	257	45	......	88	32	......	189	57	......	534	134	......	41.8	14.3	30.7
Trenton	4,256	85	11	......	42	......	9	55	20	......	182	22	......	19.9	9.8	12.9
Hawkesbury	4,198	270	114	......	42	6	......	119	4	......	431	124	......	64.3	10.0	28.3
Total	190,536	4,786	630	230	2,545	389	191	3,364	550	181	10,595	1,194	379	25.1	13.3	17.6

TABLE No. 4.

Illegitimate Births, Twins and Triplets in the Province in 1904.

Illegitimate Births. No.	Proportion to the whole number of births.	Ratio to 1,000 births.	Number of pairs of twins.	Number of cases of triplets
798	One to every 63.0 births	15.8 to 1,000	M. 550 F. 584 549 pairs	M. 10 F. 11 7 cases

TABLE No. 5.

Births in the Province in 1904, showing the Proportion of Male to Female Births.

Sex.	January.	February.	March.	April.	May.	June.	July.	August	September.	October.	November.	December.	Total.
Males	2,015	2,025	2,332	2,335	2,421	2,184	2,211	2,247	2,141	1,940	1,862	1,973	25,686
Females	2,005	2,079	2,250	2,093	2,163	2,092	2,169	2,159	2,031	1,939	1,698	1,901	24,579
Total	4,020	4,104	4,582	4,428	4,584	4,276	4,380	4,406	4,172	3,879	3,560	3,874	50,265
Male births to 100 female births	100.4	97.7	103.6	111.5	111.9	104.3	101.9	104.0	105.4	100.0	109.6	103.7	104.5

TABLE No. 6.

Order of Births by Months in the Province in 1904.

Months.	Males.	Months.	Females.	Months.	Total males and females.
Placed according to number of births in each month.					
May	2,421	March	2,250	May	4,584
April	2,335	July	2,169	March	4,582
March	2,332	May	2,163	April	4,428
August	2,247	August	2,159	August	4,406
July	2,211	April	2,093	July	4,380
June	2,184	June	2,092	June	4,276
September	2,141	February	2,079	September	4,172
February	2,025	September	2,031	February	4,104
January	2,015	January	2,005	January	4,020
December	1,973	October	1,939	October	3,879
October	1,940	December	1,901	December	3,874
November	1,862	November	1,698	November	3,560
Total	25,686		24,579		50,265

TABLE No. 7.

Marriages by Months in the Provinces in 1904.

Months.	1903.	Months.	1904.	Quarters.	1903.	Quarters.	1904.
June	2,570	June	2,973	Quarter ending 31st Dec.	5,646	Quarter ending 31st Dec.	5,624
September	2,305	December	2,128	Quarter ending 30th June	5,240	Quarter ending 30th June	5,511
December	2,230	September	2,101	Quarter ending 30th Sept.	4,995	Quarter ending 30th Sept.	4,745
October	1,863	October	1,755	Quarter ending 31st March	3,947	Quarter ending 31st March	3,872
April	1,569	November	1,741	No date given	2	No date given	37
November	1,553	April	1,497				
July	1,386	August	1,471				
January	1,347	January	1,358				
February	1,330	March	1,283				
August	1,304	February	1,231				
March	1,270	July	1,173				
May	1,101	May	1,041				
No date given	2	No date given	37				
Total	19,830	Total	19,789	Total	19,830	Total	19,789

TABLE No. 8.

Marriages by Denominations in the Province in 1904.

Denominations.	Number of persons married.	Per cent. of whole.	Proportion to the whole number of persons married.		
Methodists	12,763	32.2	As 1 is to	3.1	persons.
Presbyterians	8,221	20.7	"	4.8	"
Church of England	6,512	16.4	"	6.0	"
Roman Catholics	5,926	14.9	"	6.6	"
Baptists	2,579	6.5	"	15.3	"
Lutherans	1,131	2.8	"	34.9	"
Congregationalists	368	0.9	"	107.5	"
Evangelical Association	230	0.5	"	172.0	"
Mennonites	190	0.4	"	208.3	"
Quakers	34	0.8	"	1,164.0	"
Other Denominations	1,152	2.8	"	34.3	"
No denomination given	472	1.1	"	83.8	"
Total	39,578	100.0			

TABLE No. 9.

Showing the Death rate per 1,000 of population in each County in the Province for ten years.

Counties.	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	Average rate per county for ten years.
Algoma	.....	.....	15.9	14.0	16.0	23.7	10.4	13.8	12.4	11.8	.....
Brant	12.1	12.3	12.2	11.2	12.9	10.9	12.8	12.0	11.5	13.3	12.1
Bruce	7.9	9.7	9.7	8.6	10.1	10.0	11.3	10.4	12.0	12.3	10.2
Carleton	17.7	17.9	20.3	19.8	19.9	20.5	18.8	16.4	17.4	16.6	18.5
Dufferin	7.9	8.0	8.4	9.6	10.2	10.5	11.3	9.0	11.4	12.6	9.4
Elgin	10.2	10.1	11.0	10.2	10.4	10.3	12.2	10.6	10.9	13.3	10.9
Essex	12.0	12.6	12.9	12.3	13.2	12.3	13.3	13.1	13.0	13.2	12.7
Frontenac	11.2	13.3	13.8	13.9	12.8	13.6	16.0	13.6	16.1	14.2	13.8
Grey	8.1	9.7	9.5	9.8	9.7	9.9	12.3	11.0	11.4	11.1	10.2
Haldimand	8.4	7.7	10.5	9.8	10.2	9.8	12.3	11.3	9.8	12.4	10.2
Halton	8.9	9.2	9.2	9.4	10.7	11.3	14.6	12.1	11.6	13.8	11.0
Haliburton	10.7	12.4	11.2	9.5	10.3	9.0	11.1	10.1	12.1	12.2	10.8
Hastings	9.2	11.2	11.4	10.8	11.1	11.6	14.4	11.5	11.8	12.1	11.5
Huron	7.7	8.3	10.5	9.2	10.5	9.9	11.8	10.0	11.1	11.3	10.0
Kent	9.2	9.8	11.7	11.6	12.1	11.6	13.4	12.0	11.6	12.8	11.5
Lambton	7.6	8.6	10.8	9.7	12.3	11.7	13.3	12.1	12.1	12.3	11.0
Lanark	6.9	10.2	11.8	11.4	11.3	11.6	13.2	11.7	11.8	13.5	11.3
Leeds and Grenville	7.3	10.9	12.5	12.6	12.6	12.1	14.4	13.4	15.1	15.2	12.6
Lennox and Addington	6.8	9.4	12.6	11.3	11.9	10.6	13.0	11.8	11.4	11.1	10.9
Lincoln	13.1	12.2	14.4	12.5	13.4	14.0	14.1	12.6	12.6	15.8	13.7
Middlesex	9.6	8.7	10.7	10.0	10.9	10.4	13.5	13.4	13.7	15.2	11.6
Muskoka	.....	.....	11.4	11.0	13.0	14.7	11.7	11.2	11.8	13.2	.....
Norfolk	9.2	9.4	12.1	10.4	11.8	11.9	13.4	13.3	11.6	18.6	12.1
Northumberland and Durham	9.9	10.1	11.6	11.6	12.2	11.9	13.7	13.9	13.7	14.3	12.2
Nipissing	.....	.....	23.5	20.5	26.6	33.7	17.0	16.2	17.7	13.4	.....
Ontario	9.8	10.2	10.6	10.3	10.3	11.7	13.3	12.8	12.1	12.9	11.4
Oxford	10.3	11.3	11.8	11.5	12.8	12.9	13.8	12.3	13.3	14.6	12.4
Peel	7.1	9.4	9.1	9.2	10.8	9.6	13.2	10.8	12.3	12.3	10.3
Perth	9.0	8.8	9.5	10.8	9.5	10.4	12.2	11.0	12.3	13.2	10.6
Peterboro	10.4	11.2	12.0	12.7	13.3	12.4	12.8	14.2	14.8	18.9	13.2
Prescott and Russell	11.7	13.1	16.9	13.6	15.3	16.1	18.0	13.8	16.4	15.1	15.0
Prince Edward	9.7	13.8	12.4	11.0	12.1	12.0	15.5	13.7	13.2	14.7	12.8
Parry Sound	.....	.....	14.7	13.6	16.3	19.2	10.2	11.3	10.3	12.6	.....
Rainy River	.....	.....	33.1	26.1	23.8	45.6	9.3	8.5	7.9	10.8	.....
Renfrew	9.9	12.2	13.0	9.9	10.3	11.3	12.2	11.1	12.0	12.1	11.4
Simcoe	7.4	10.7	11.7	11.3	12.1	13.0	11.2	11.3	12.4	12.7	11.3
Stormont, Dundas and Glengarry	7.8	9.0	12.7	11.3	11.9	10.9	12.8	11.4	11.4	13.6	11.2
Thunder Bay	.....	.....	20.4	16.4	21.7	30.2	11.5	16.8	20.0	25.0	.....
Victoria	9.0	9.8	10.8	10.8	10.4	11.7	12.3	11.9	12.5	12.1	11.1
Waterloo	10.1	10.1	10.9	10.2	11.2	12.0	11.8	10.0	11.3	11.5	10.9
Welland	11.0	12.1	14.4	12.9	13.1	11.8	13.7	12.6	14.1	15.7	13.1
Wellington	9.5	9.5	9.9	9.3	10.9	10.6	12.2	11.0	12.6	13.4	10.8
Wentworth	12.7	13.2	12.1	13.0	12.8	13.0	14.7	13.7	14.6	16.7	13.6
York	13.2	12.4	12.9	11.8	13.5	14.5	15.6	14.5	17.0	17.9	14.3
Average rate	9.7	10.7	12.9	11.9	13.2	14.0	13.1	12.6	12.8	14.1	12.5

TABLE No. 10.

Recapitulation by Classes of Diseases by Counties in 1904—(Including Cities and Towns), showing Sex, Nativity, Social Condition, Age Groups and Months.

Cause of Death.	Sex: Male.	Sex: Female	Sex: Not stated	Nativity: Canada.	Nativity: Foreign.	Nativity: Not stated	Social condition: Single.	Social condition: Married.	Social condition: Not stated	Ages: Under 5: 0-1	Under 5: 1	Under 5: 2	Under 5: 3	Under 5: 4	5-9.	10-14	15-19	20-24	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given	Months: January.	February.	March.	April.	May.	June	July.	August.	September.	October.	November.	December	Totals.
I Communicable (epidemic) diseases	911	787	[illegible]	1463	245	21	1241	437	[illegible]	192	120	116	106	76	247	101	82	116	84	57	52	39	35	52	58	97	86	14	231	211	190	120	116	86	74	111	135	144	129	[illegible]	1730
II Other general diseases	2410	2752	[illegible]	3881	1184	99	1863	3011	260	29	61	40	17	22	78	107	328	488	500	407	378	358	323	670	665	197	155	10	451	428	472	507	486	410	436	404	359	413	367	401	5164
III Diseases of nervous system and organs of sense	1958	1731	[illegible]	2413	1115	68	1522	2002	170	615	335	67	36	51	80	71	53	82	65	81	75	102	139	316	512	712	398	32	332	335	371	331	338	261	304	282	280	291	282	287	3694
IV. Diseases of circulatory system	1228	1139	[illegible]	1302	1010	55	492	[illegible]	[illegible]	13	2	3	5	2	36	42	60	64	61	51	68	79	125	303	558	602	272	20	228	[illegible]	227	211	218	171	148	166	171	173	192	217	2367
V. Diseases of the respiratory system	1774	1478	[illegible]	2211	982	59	1487	1611	[illegible]	625	203	80	39	19	61	40	83	86	90	68	73	85	106	234	431	561	336	29	115	476	117	317	294	191	125	85	150	166	253	330	3252
VI. Diseases of the digestive system	1373	1217	1	2060	185	49	1546	968	86	862	99	34	29	25	66	86	89	93	89	82	65	92	66	201	261	260	96	[illegible]	162	178	164	168	166	165	274	165	361	216	135	140	2591
VII. Diseases of the genito-urinary system	653	422		627	419	29	206	816	51	7	3	5	1		10	16	17	28	41	41	63	59	53	125	228	259	100	15	95	101	118	95	97	95	79	70	65	93	78	89	1075
VIII. Puerperal diseases	4	270		230	37	7	18	253	3	...	...	...	...	...	...	...	13	45	71	51	51	26	4	4	...	...	...	3	21	21	29	29	12	25	20	22	19	14	19	13	274
IX. Diseases of the skin and cellular tissue	66	45		63	45	3	31	77	3	13	...	...	2	...		1	2	1	1	1	6	9	5	17	15	25	12	1	17	17	12	17	9	4	6	3	5	9	6	[illegible]	111
X Diseases of the locomotor system	9	6		11	3	1	7	8	.	1	...	...	...	1	1	...	1	.	1	1	...	...	2	2	1	...	...	1	2	1	..	2	1	...	...	...	2	2	4	1	15
XI. Malformations, diseases of infancy, diseases of old age	4515	3669	[illegible]	5692	2506	79	4876	3218	153	1161	61	27	7	6	1	...	...	...	...	...	...	...	...	...	123	1231	2322	37	737	822	779	688	788	602	612	664	642	646	616	681	8277
XII Suicide	77	36		81	28	4	40	65	8	...	.	...	...	...	..	1	6	7	5	8	10	11	8	21	21	10	1	1	5	4	9	9	13	5	10	7	9	19	7	16	113
XIII Accident	1050	256	[illegible]	811	574	23	633	553	122	31	31	36	14	17	60	57	90	137	111	105	90	78	62	101	100	77	51	4	86	79	81	82	103	135	138	140	108	109	113	134	1308
XIV. Ill defined causes	626	690		924	346	46	401	839	76	30	15	7	1	5	15	30	38	63	60	53	79	86	82	211	274	154	78	32	127	104	121	131	127	107	111	87	90	107	103	101	1316
Total	16,714	14,501	77	21,901	8,773	616	14,366	15,643	1,281	6,902	735	413	261	202	655	652	865	1,210	1,168	1,012	1,013	1,024	1,009	2,254	3,280	4,518	3,911	286	2,939	2,989	2,990	2,737	2,798	2,290	2,337	2,506	2,399	2,402	2,304	2,699	31,290

TABLE NO. 11.

Recapitulation by Classes of Diseases by Cities, 1904.

Causes of Deaths.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social condition. Single.	Social condition. Married.	Social condition. Not stated.	Ages. Under 5: 0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given
I. Communicable (Epidemic) diseases	256	224		385	88	7	345	128	12	39	38	35	37	20	71	28	21	37	34	16	21	13	10	11	10	21	12	6
II. Other general diseases	669	785		921	491	39	523	865	6	2	19	8	4	1	27	23	92	138	131	110	117	116	87	213	192	126	31	11
III. Diseases of nervous system and organs of sense	558	469	..	647	364	16	438	550	39	223	16	19	10	8	15	9	12	18	18	19	22	33	40	96	161	182	87	11
IV. Diseases of circulatory system	319	364		341	359	13	164	505	41	1	..	1	1	1	12	15	20	22	26	17	23	28	38	117	163	157	61	10
V. Diseases of the respiratory system	548	477	.	634	366	25	462	514	49	183	78	29	9	7	15	10	20	22	28	28	26	28	32	88	156	135	116	16
VI. Diseases of the digestive system	451	428	.	685	177	17	568	294	17	361	31	9	4	5	12	29	19	36	33	27	28	31	25	64	76	59	20	4
VII. Diseases of the genito-urinary system	207	152		175	175	9	65	271	23	4	2	..	..	.	3	2	4	12	19	15	22	23	17	52	75	75	28	4
VIII. Puerperal diseases	....	52	..	35	16	1	...	52	..	....	.	..	..	.		.	2	4	17	7	14	7	1	....	..			
IX. Diseases of the skin and its adnexa	23	12	.	18	17	.	8	25	2	6	..	..	..	.	..	..	..	..	..	1	3	2	2	8	8	4	1	
X. Diseases of the locomotor system	3	3	..	3	3		3	3	.	....	..	..	.	..	.	2	..	1	...	.	1	..	.	2	.			
XI. Malformations, diseases of infancy, diseases of old age	1101	951	18	1592	467	14	1518	515	40	1438	15	3	2	..	1	..	..	.	...	...	.	.	.	..	12	224	337	11
XII. Suicide	7	6	.	12	1	..	3	10	..	...	..	..	..	..	.	.	1	..	...	...	2	2	1	3	4	.	.	
XIII. Accident	245	83	..	201	110	17	159	152	17	6	4	6	6	3	19	11	26	32	30	30	30	19	11	30	32	16	10	7
XIV. Ill-defined causes	142	156		191	92	15	82	192	21	2	2	..	..	2	3	9	10	15	17	18	19	28	21	62	49	17	15	6
Totals	4,559	4,165	18	5,843	2,729	170	4,337	4,076	332	2,268	238	110	73	50	178	138	227	337	368	288	328	330	288	746	967	1,016	716	86

Causes of Deaths.	Months. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
I. Communicable (Epidemic) diseases	66	51	41	38	37	30	13	31	43	35	35	54	480
II. Other general diseases	133	121	139	157	123	121	103	123	93	115	110	113	1454
III. Diseases of nervous system and organs of sense	103	88	90	100	97	81	80	83	78	76	78	73	1027
IV. Diseases of circulatory system	61	69	77	54	71	55	32	16	51	55	53	85	713
V. Diseases of the respiratory system	170	116	111	92	118	58	41	24	48	45	72	97	1025
VI. Diseases of the digestive system	58	49	45	51	60	54	114	180	113	70	42	43	879
VII. Diseases of the genito-urinary system	37	31	36	31	39	24	29	22	20	28	31	28	359
VIII. Puerperal diseases	5	3	6	6	7	5	2	3	3	5	3	4	52
IX. Diseases of the skin and its adnexa	8	6	5	6	2	....	2	....	1	....	2	3	35
X. Diseases of the locomotor system	...	2	2	....	....	1	....	...	1	....	....	...	6
XI. Malformations, diseases of infancy, diseases of old age	186	204	191	161	210	155	178	169	177	158	148	136	2073
XII. Suicide	...	1	....	2	2	1	1	....	....	3	2	1	13
XIII. Accident	29	17	19	25	21	32	28	33	36	25	32	31	328
XIV. Ill-defined causes	33	21	23	27	31	19	21	31	25	16	21	21	298
Totals	892	765	791	750	821	638	847	748	722	629	629	712	8,742

TABLE No. 12.

Recapitulation by Classes of Diseases by Towns, 1904.

Cause of Death.	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Social con Single.	Married.	Not stated.	Ages. Under 5. 0.1.	1. 2	2.	3.	4.	5-9.	10-14	15-19.	20-24.	25-29	30-34	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given.	Months. Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Totals.
I. Communicable (Epidemic) Diseases	60	48	...	79	25	4	70	30	8	8	5	7	7	2	18	2	5	13	13	1	6	3	2	5	1	4	6	.	6	19	13	6	3	9	8	10	9	6	8	11	108
II. Other General Diseases	123	160	...	213	56	14	117	147	19	1	3	1	1	2	8	10	21	40	23	26	24	25	20	23	37	10	2	3	25	18	21	23	38	30	25	28	17	15	15	28	283
III. Diseases of Nervous System and Organs of Sense	93	81	..	115	57	2	71	91	12	37	8	4	.	.	4	3	6	3	5	5	3	4	1	25	17	33	15	1	15	11	19	11	15	13	17	14	14	17	15	13	174
IV. Diseases of Circulatory System	56	52	....	62	43	3	23	71	11	.	1	1	1	.	1	2	5	3	3	4	1	8	8	14	22	18	13	.	5	12	11	10	10	8	8	5	9	10	9	11	108
V. Diseases of the Respiratory System	103	73	....	121	49	6	86	84	6	36	11	6	2	.	7	3	9	4	7	4	3	7	4	9	35	20	9	.	15	23	27	17	16	12	9	4	5	12	19	17	176
VI. Diseases of the Digestive System	66	55	...	96	21	4	76	40	5	40	1	2	3	1	1	3	6	3	7	7	3	1	2	8	10	9	1	1	7	14	6	7	6	9	16	31	3	7	4	5	121
VII. Diseases of the Genito urinary System	38	19	...	32	21	4	12	45	....	1	1	1	2	.		.	1	1	4	4	2	2	2	5	11	9	..	3	4	6	5	4	4	4	1	3	4	11	7	4	57
VIII. Puerperal Diseases	....	12	....	7	5	....	...	10	2	...	.	.	..	.	..	..	3	1	2	.	1	2	.	...	...	..	.		.	.	2	.	1	.	2	3	2	1	..	1	12
IX. Diseases of the Skin and Cellular Tissue	2	....	....	1	1	....	...	1	1	...	.	.	..	..	..	.	.	.			.	1	.	1					1	.	...	.	.	.	...	.	.	.	1	..	2
X. Diseases of the Locomotor System	...	....	....	...	....	....	...	....	....	...	.	.	..	.	..		.	.	.										.	.	..	.	.	.	.	...	.	.	.	.	....
XI. Malformations, Diseases of Infancy, Disease of Old Age	240	157	3	296	101	3	250	147	3	237	2	1	.	...	.	.	.	.		.	.	.	.	.	3	61	95	1	12	42	41	31	32	20	27	30	39	33	31	29	400
XII. Suicide	8	3	....	6	5	....	3	7	1	...				.	.	.	.	2	.	.	.	1	2	..	3	2	1		1	..	1	.	.	.	2	2	..	2	.	3	11
XIII. Accident	96	14	....	62	39	9	54	49	7	2	1	3	.	2	3	6	5	21	12	8	5	6	8	11	4	7	1	5	5	5	6	4	7	14	13	14	8	11	8	15	110
XIV. Ill-defined causes	37	32	...	47	20	2	13	51	5	...	1	..	.	.	.	2	5	3	5	1	6	8	6	12	9	9	..	2	9	4	9	9	6	5	6	5	3	2	4	7	69
Totals	922	706	3	1,137	443	61	775	776	80	362	37	26	16	7	48	31	69	94	81	60	57	71	55	113	155	182	151	16	135	154	164	125	138	124	134	149	119	127	121	141	1,631

TABLE

Total Deaths by Individual

General Diseases		Number.	Algoma.	Brant	Bruce.	Carleton.	Dufferin.	Elgin.	Essex	Frontenac.	Grey.	Haldimand.	Halton.	Haliburton.	Hastings.
Communicable Diseases.	Typhoid Fever	1	6	11	10	18	3	6	20	9	8	1	3	2	4
	Smallpox	2													
	Measles	3	1		1	5			2	1					
	Scarlet Fever	4	3	1	4	5		6	4		7	5			
	Whooping Cough	5	2			9	2			1	7	1			4
	Diphtheria and Croup	6	14	7	15	4	3	9	27	12	12	3	4	4	15
	Influenza	7	10	5	8	8	4	12	10	5	7	3	2	2	5
	Other Epidemic Diseases	8									1				1
Other General Diseases.	Pyaemia and Septicemia	9		6	11	11	3	5	5	5	1	3	3	2	6
	Malarial Fever	10									4		1		1
	Tuberculosis and Scrofula	11	62	59	77	154	16	40	86	69	73	17	20	7	70
	Syphilis	12				3									
	Cancer	13	5	19	28	51	12	27	28	26	43	11	14	4	30
	Rheumatism and Gout	14	2		4	6		5		8	1	2		1	3
	Diabetes	15				3				3	3	3	2	1	11
	Other General Diseases	16	4	3	11	19	6	6	5	5	14	2	5		11
	Alcoholism, Acute and Chronic	17				3			2						1
Diseases of the Nervous System.	Encephalitis	18	6	1		2		7	7	8	11	4	3		4
	Simple Meningitis	19	5	11	16	25	4	8	21	12	11	3	5	1	14
	Epidemic Cerebro-spinal Meningitis	20	2	2	3	4		3	4	1	4	2		1	2
	Congestion and Hemorrhage of the Brain	21	2	19	22	45	1	21	83	16	20		13		25
	Softening of the Brain	22		2		2	1	2	1	1		1		1	1
	Paralysis without specified cause	23	5	19	28	41	11	47	18	53	23	15	10	2	18
	Insanity	24		4		2				3	2				1
	Epilepsy	25	2		1	3		1	2	2	4	1	1	1	1
	Convulsions (not puerperal)	26	1	9	21	15	1	11	9	10	16	3	5	4	16
	Other Nervous Diseases	27	1	5	11	4	2	6	2	2	5	1	3		6
Diseases of the Circulatory System	Pericarditis	28	3		2	1		3	1	1					
	Endocarditis	29		1	2	13		1	3	3	2		1		1
	Organic Heart Diseases	30	15	28	42	77	18	34	32	43	47	26	24	3	42
	Angina Pectoris	31		2	1	2			1		1				1
	Dis. of the Arteries, Atheroma, Aneurism, etc	32		2	5	11	1	1	4		7	2	1		1
	Other Diseases of the Circulatory System	33	20	2	26	51	14	33	20	25	8	4	2	1	2
Diseases of Respiration.	Acute Bronchitis	34	2	7	14	30	3	3	8	1	23	3	5	3	13
	Chronic Bronchitis	35	1	2	2	13		1	2	1	9		2		2
	Broncho-pneumonia	36	1	3	7	36	7	1	12	1	12	2	1		4
	Pneumonia	37	2	34	26	91	22	35	45	38	36	19	16		53
	Pleurisy	38	4		1	11	1		2		6	2	1		2
	Congestion of the Lungs (inc. pulm. apop.)	39	11	2	4	9	2	3	11	4	13	4	2		8
	Asthma and Emphysema	40			2	6	1		1	2		2	1		
	Other Diseases of the Respiratory System	41	7	3	2	3			1	1					
Diseases of Digestive System	Ulcer of the Stomach	42									3	1			2
	Other Dis. of the Stomach (Cancer excepted)	43	6	5	8	18	12	5	7	9	12	1			13
	Infantile Diarrhoea and Gastro-enteritis ("Cholera Infantum")	44	21	10	9	109	5	18	36	11	16	3	5		28
	Diarrhoea and Enteritis (not infantile)	45	3	1	2	5			4	1	4		2		6
	Dysentery	46	2	1	2			4	2		3				8
	Hernia and Intestinal obstructions	47	1	1	9	9	2	4	4	7	3	3	4		8
	Other Diseases of the Intestines	48	8	4	9	14	2	1	2	2	8				
	Diseases of the Liver	49	2	3	2	13	1	10	9	8	11	4	5	1	7
	Peritonitis (not puerperal)	50	6	5	9	24	2	12	9	4	7	2	4	1	2
	Iliac abscess (typhlitis, peri-typhlitis, appendicitis)	51	4	11	5	15	3	6	2	9	8	2	7	1	3
Diseases of the Urinary System.	Acute Nephritis	52	1	3	3	12		1	8				1		5
	Bright's Disease	53	6	4	12	17	7	14	5	9	9	4	5	2	13
	Other Diseases of the Kidneys and Adnexa	54	7	4	12	7	3	11	3	8	4	4		1	2
	Vesical Calculi	55			2					1					
	Diseases of the Bladder	56	2	5	5	5	1	1		1	4				1
	Diseases of the Male Genital Organs	57	1	1	2	3							1		
	Metritis	58													
	Other Diseases of the Uterus	59													
	Ovarian Cysts and other Ovarian Tumors	60	1				1					1			
	Other Diseases of the Female Genital Organs	61		2	1	2			1		4				2

NO. 13.

Diseases by Counties in 1904.

Huron.	Kent.	Lambton.	Lanark.	Leeds and Grenville.	Lennox and Addington.	Lincoln.	Middlesex.	Muskoka.	Nipissing.	Norfolk.	Northumberland and Durham.	Ontario.	Oxford.	Parry Sound.	Peel.	Perth.	Peterboro'.	Prescott and Russell.	Prince Edward.	Rainy River.	Renfrew.	Simcoe.	Stormont, Dundas and Glengarry.	Thunder Bay.	Victoria.	Waterloo.	Welland.	Wellington.	Wentworth.	York.	Total.	Numbers.
7	15	10	2	13	2	13	22	4	27	9	7	9	13	6		8	8	8	3	9	12	10	12	35	6	7	5	7	11	81	482	1
											1																			2	3	2
2	1		1								2		1					2		2	1					1				7	20	3
1	2	2	5	5		4	16	2	2	4	2	3	6	2	4	1	6	2		5	5	4	4	2	4	3	8	4	6	14	163	4
5	5	2		1		1	5		8					2		3		20				10	7	1			1		4	8	109	5
6	12	5	14	12	4	10	32	2	17	2	9	4	2	6	7	4	18	16	3	9	20	18	16	19	4	11	12	7	18	160	608	6
7	7	3	4	16	4	1	18	4	4	6	13	12	7	3	6	1	6	9	3	3	7	10	13	2	7	14	4	9	15	52	331	
2																															4	8
2	5	14	5	8		4	13	2	6	3	4	1	6	2	1	3	4		2	1	7	5	8	4	3	4	4	4	6	50	245	9
		1															1		1											2	11	10
58	67	83	48	115	25	48	155	33	21	21	58	55	41	25	28	45	54	67	26	11	53	88	149	29	44	36	36	56	135	439	2,877	11
																														2	5	12
42	31	27	17	22	8	29	74	10	5	24	32	19	33	9	11	79	11	27	14	3	15	37	34	4	8	29	8	56	69	228	1,253	13
3	3	8	5	7	1	2	7	5	7	4	10	5	5	3	1	1	4	1	1	1	6	11	7	1	5	3	1	1	8	20	182	14
5	9	7	3	7	2	3	14	3		4	10	4	4	4	8	6	2	2	4	1		4	2	1	3	1	3	4	4	34	184	15
16	9	5	6	12	3	8	20	1		4	16	9	11	2	4	15	11	1	6	1	6	17	9	1	7	4	3	12	13	56	379	16
		2							1	2	1	1		1		1	1			1	2	1			1		1			6	28	17
7	12	2	2	2		3	8	3	2	2	3	1	4	3		4	2	13	2		6	1	8		1	2	6	2	4	8	166	18
10	10	7	9	11	1	7	15	3	2	6	6	6	6	2	1	12	3	1		2		22	9	2	13	9	4	9	23	86	441	19
1		6		3		2	3	2	1	1	1	1	4	1		1		1		1	1	10					1	1	3	14	88	20
29	22	29	11	33	9	16	42	7	2	12	38	27	27	5	7	23	9	10	6	1	5	40	18	3	12	24	10	28	65	183	971	21
3	2	3		3	3	1	4			1	7	4	4		1	2	1	3	1		1	4				1	2		9	27	90	22
21	26	23	26	40	21	14	52	4	4	16	25	8	23	7	15	15	21	16	12	3	16	25	28	2	9	15	19	38	32	133	999	23
2	1			11	2		4	1	2		1		1		5	1	2				1	2	1					1	7	18	73	24
3				8		1	5	2		3	1		1		1	1	1	2	1		5	7	3			1	2	4	9	16	94	25
10	11	14	14	9	8	7	25	10	11	4	17	5	9	10	7	4	6	3	3	4	12	19	8	7	8	21	11	15	11	111	560	26
7	7	5	5	7	1	3	9	3	4	3	6	2	3		3	4	3	5	4		9	6	3		5	9	2	4	8	23	199	27
							2	1						2						1									3	8	28	28
2		2	3	3		1	3	1	1		1	3		2		5	1	4			2	1	1	1	1	1	2	3	5	18	95	29
50	46	38	19	55	14	42	80	14	18	27	52	27	52	4	18	37	27	15	15	4	25	73	31	11	26	47	22	47	74	345	1,784	30
2	2				1	1	4	2			2	3	4		2	1	2				2	1	1				1	3	2	21	66	31
3	3	6		4		2	8	1	1		8	2	2	2	1	4	1	2			1	3	5	1	1	6	2	1	11	[illegible]	153	32
6							1		1																			1			23	33
16	8	10	7	15		9	34	5	10	3	11	11	10	12	2	8	12	13	1	6	11	21	17	7	9	9	9	8	21	118	447	34
1		1	2	2		2	6			2	4	6	2		1	5	1					3	2	1		3		3	13	25	118	35
10	5	6	3	7		5	5	2	9	5	3	10	6	4	6	8		2	1		2	17	8	5	5	10	2	7	14	111	366	36
49	34	38	39	46	15	25	86	31	12	30	36	30	60	21	15	33	26	24	7	13	25	45	64	40	16	25	25	32	112	247	1,738	37
2	3	5	3	10		4	5		3	1	7	1	6	2			7			1	7	10	3		1	3	1	6	16	25	178	38
4	7	7		2		4	8		8	4	3	3	11	2		4	3	16	1	2	13	6	6	3	1	7	2	7	8	20	[illegible]	39
1	4	2	3	2	1	3	7			1	4			1				1			2	4	2		2	2	2	2	3	14	79	40
			1							1															1					1	21	41
1		2	1	1	1		3	1		2	1		2	1		2	1		2						1	2	1	2	1	3	40	42
6	7	5	8	12	2	2	13	2	2	4	9	6	3	2	1	5	6	3	1		6	6	14		6	5	2	8	10	25	277	43
6	14	17	5	17	2	15	35	13	15	4	10	13	12	5	8	6	12	47	2	11	31	19	20	15	4	10	13	15	26	216	904	44
5	3	8	5	5	1	7	14	3	3	3	4	3	4	1		3	5	7	1		4	6	10	3	4	6	3	4	10	18	181	45
	2	1		1	1		1			1			2							1	1	3	1				2	1	1	6	12	46
4	7	4	3	1		2	10	1	4	4	7	4	7	1	2	2	4	1	3		5	4	2			5		6	4	22	174	47
1	4	1	6	3			3				2	3	1		1	1	5		1		1	2	3		1	4		3	4	15	113	48
5	11	8	7	10	2	5	10	1	1	5	9	1	6	1	1	7	5		3		4	2	6	1	4	4	5	9	8	42	262	49
8	8	9	3	6	3	2	9	4	6	5	12	9	10	3	5	10	2	5	1		1	7	2	2	7	4	1	8	18	76	333	50
8	5	7	7	4	1	3	13		3	4	9	4	6	9	2	5	4	2			8	9	10	3	4	7	7	10	6	42	268	51
3	5	4	1	3		2	5		1	6	6	7	5	3		3	6	2	1			2	2	3		4	3	5	5	64	185	52
6	9	9	6	10	4	12	29		1	9	12	13	6	3	13	11	10	5	7	1	8	27	14	6	6	11	9	14	37	108	523	53
6	2	6	5	5	1	3	15	4	1	2	4	2	6		2	2	6	8			3	9	11		1		5	1	2	10	188	54
			1							1														1				1		1	8	55
8	1	3	2	3	2		5				1	1	2	3	1		1	1	2		2	1	2	1	2	1	3	8	6	14	107	56
1	1	1				2											1					2						1	2	3	22	57
																								1							1	58
																																59
	1					1							2										1							4	12	60
	1					1	1				2					1	1	1				1							2	6	29	61

TABLE

Deaths by Individual

	General Diseases	Number	Algoma.	Brant.	Bruce.	Carleton.	Dufferin	Elgin.	Essex.	Frontenac	Grey.	Haldimand.	Halton.	Haliburton.	Hastings.
Puerp'ral Diseases.	Puerperal Septicemia	62	5	2	1	3	....	....	2	....	....	....	....	....	2
	Puerperal Albuminuria and Convulsions	63	6	1	2	4	4	....	2	....	2	....	....	....	....
	Other Accidents of Pregnancy, sudden death	64	12	....	....	2	1	5	4	4	6	2	2	3	2
	Puerperal Disease of the Breast	65	....	....	....	....	....	....	....	....	....	....	....	....	....
Dis. of Skin	Erysipelas	66	....	1	3	1	1	....	1	1	5	1	1	....	3
	Other Diseases of the skin and its adnexa (Cancer excepted)	67	....	....	1	....	....	....	....	....	....	....	2	....	2
Dis. Loco mot'n	Pott's Disease	68	....	....	....	1	....	....	....	....	....	....	....	....	....
	Diseases of Bones and Joints	69	....	1	....	....	....	....	....	....	1	....	1	....	....
	Amputation (for unspecified Disease)	70	....	....	....	....	....	....	....	....	....	....	....	....	....
Mal-formations.	Still-Births	71	28	43	38	121	21	15	54	22	30	10	4	5	21
	Congenital Debility and malformations	72	84	35	25	169	23	30	62	45	61	17	15	8	44
	Other Diseases of Infancy	73	12	1	7	31	....	1	10	....	6	3	....	....	5
	Senile Decay	74	33	69	99	122	30	61	78	74	158	39	33	7	109
Suicide	Poison	75	....	....	....	1	....	....	....	1	1	1	....	....	1
	Strangulation	76	....	....	1	....	....	....	1	2	2	1	....	....	....
	Gas Poisoning	77	....	....	....	....	....	....	....	....	....	....	....	....	....
	Drowning	78	....	1	....	2	....	2	....	....	....	....	....	....	1
	Firearms	79	....	....	....	....	....	....	....	....	....	....	....	....	1
	Other Methods	80	....	....	....	....	....	1	1	1	....	1	2	....	1
Accidents	Fractures and Dislocations	81	....	1	....	2	....	1	1	....	2	....	....	....	....
	Gunshot	82	3	1	1	2	....	....	1	2	3	....	....	....	2
	Lightning	83	1	1	....	....	....	....	....	....	....	1	....	1	1
	Drowning	84	10	2	6	5	....	4	5	4	5	4	4	1	7
	Electric Cars	85	....	....	....	3	....	1	....	....	....	....	....	....	....
	Bicycles	86	....	....	....	....	....	....	....	....	....	....	....	....	....
	Railways	87	4	4	5	8	1	5	6	2	2	....	5	....	1
	Burns and Scalds	88	....	3	....	4	....	2	2	1	....	1	....	....	4
	Homicide	89	....	....	....	....	....	....	....	....	....	....	....	....	....
	Other Accidents	90	25	11	6	14	5	11	8	7	17	3	5	6	18
	Asphyxia	91	....	....	....	....	....	....	....	....	....	....	....	....	....
	Poison	92	....	....	....	....	....	1	1	1	....	2	1	1	....
Ill-Defined Causes	Dropsy	93	6	3	10	11	2	10	5	17	17	6	1	4	15
	Tumors	94	1	4	6	18	....	5	7	4	9	1	....	....	8
	Other Ill-Defined Causes	95	16	5	23	23	4	7	11	10	16	3	13	4	22
	Heart Failure	96	....	....	....	....	....	....	....	....	....	....	....	....	....
	Tetanus	97	....	....	....	....	....	....	....	....	....	....	....	....	....
	Totals		541	513	735	1,627	269	566	784	640	880	266	273	81	728

NO. 13.—*Continued.*

Diseases by Counties in 1904.—*Continued.*

Huron.	Kent.	Lambton.	Lanark.	Leeds and Grenville.	Lennox and Addington.	Lincoln.	Middlesex.	Muskoka.	Nipissing.	Norfolk.	Northumberland and Durham.	Ontario.	Oxford.	Parry Sound.	Peel.	Perth.	Peterboro'.	Prescott and Russell.	Prince Edward.	Rainy River.	Renfrew.	Simcoe.	Stormont, Dundas and Glengarry.	Thunder Bay.	Victoria.	Waterloo.	Welland.	Wellington.	Wentworth.	York.	Total.	Numbers.
1	1	2									2	1			1	3						2						2	8	6	39	62
	2	2	2	2	1		2		2		2	1	2	2	2	1	4				1	6				2	2	1	3	15	78	63
5	1	3	3	6	1	2	4	4	9	1	4		2	5	1	2	5	6		1	8	6	8		2	1	4	2	3	15	157	64
																																65
1	2		1	1			7	1		3	4	2	4	1			1	3		1	1	2	3			2	1		10	17	86	66
		1					2				1	1	2					1			1	4							1	6	25	67
											1																				2	68
1	1	1							1		1		1			1										1			2		13	69
																																70
23	39	33	32	40	8	34	54	25	136	16	35	22	29	17	6	22	41	26	7	6	29	58	27	13	14	22	33	36	105	310	1,690	71
49	74	54	37	68	25	34	90	25	13	29	56	38	51	30	17	42	51	171	13	20	86	91	90	28	34	62	32	66	104	492	2,688	72
1	4	4		6	1	1	7	1	18	1	6	1	3	4		6	5	11	2	1	9	5	3	5	2			1	3	14	201	73
110	92	78	86	142	55	48	188	15	23	23	179	72	113	23	48	66	63	59	57	9	84	151	158	10	57	93	92	119	115	321	3,711	74
		1	1	1			1			1	1		1				2				2	1				1		1		2	21	75
			1	1	2	1	1	1				1				1							1			2	1	1	2	1	24	76
																										1					1	77
		1					1	1								1												8	1		14	78
	1	2					3										1				1						1			3	18	79
	2	2				1	1			3	1				2	1	2		1		2	1				3	2		2		33	80
1	4	2		2		3	11		3		2	4	4	2	3	4	3	1	1	2	3	9	4	16	4	4	7	6	5	24	142	81
	3	1	2	3			3		2		1			3	1						2		3	4				2		3	48	82
3							1			1	1		1								2						2		2		18	83
2	9	4	3	3	3	7	4	5	7		6	4		11	1	3	6	1	1	7	1	13	12	8	4	1	12	2	3	19	219	84
																										1			3	11	19	85
																																86
3	2	4	1	1	1	1	9	2	7	3	3		12	2			1	1		7	14	8	2	11	2	2	10	6	8	20	186	87
1	4	3	1		1	5	2	1	5	3	2		1	1		1	2	1		1	1	2	6	2		3	1		5	22	94	88
		1					1											3											1	3	9	89
9	10	16	8	10	7	9	21	8	22	11	4		8	10	4	9	14	6	3	9	7	20	12	4	3	11	19	13	27	47	497	90
									1		1							1			1						2	1		12	19	91
1		2		2		1	1	2		1	1		2			1	1	1							1					12	36	92
9	11	5	7	13	4	5	10	2	3	5	5	2	5	4	1	6	6	8	3	2	10	5	6		10	11	2	6	4	11	288	93
7	9	3	3	3	2	2	8	2	1	2	4	8	4	3	1	5	4	4	1		1	2	11	2	2	5	2	7	15	39	220	94
9	9	9	5	14	4	6	19	3	11	9	13	10	15	8	2	7	14	17	1	6	7	15	10	7	1	7	3	6	8	21	453	93
9	10	12	10	13	3	5	18	6	12	4	18	10	15	8	3	10	6	9	2	8	10	20	19	2	6	7	20	16	19	61	341	96
2	2										1					1									1					2	9	97
710	742	704	510	906	263	488	1,477	281	502	421	842	526	714	311	288	550	552	704	231	180	644	1,057	952	329	391	813	502	755	1,341	4,931	31,290	

TABLE NO. 14.

Total Deaths by Individual Diseases in Cities in 1904.

General Diseases	Toronto.	Hamilton.	Ottawa	London.	Kingston.	Brantford	St. Thomas.	Guelph.	St. Catharines.	Belleville.	Stratford.	Windsor.	Chatham.	Woodstock	Totals.
I. COMMUNICABLE (EPIDEMIC) DISEASES.															
1. Typhoid Fever	56	9	13	17	4	9	4	1	8	1	5	8	7	4	146
2. Smallpox	2														2
3. Measles	7		5											1	13
4. Scarlet Fever	11	5	3	7							1			2	29
5. Whooping Cough	8		9	3							3				23
6. Diphtheria and Croup	127	14	6	21	7	7	6	4	3	3		4	6	1	209
7. Influenza	22	10	2	5	2	3	1	3		1		4	2	3	58
8. Other Epidemic Diseases															
II. OTHER GENERAL DISEASES.															
1. Pyemia and Septicemia	39	4	5	3	4	2	3	1	3	1	1		1	1	68
2. Malarial Fever	2														2
3. Tuberculosis and Scrofula	338	101	114	62	35	16	7	8	22	13	13	19	17	12	777
4. Syphilis	2		3												5
5. Cancer	187	45	40	42	17	9	5	10	10	6	4	9	5	11	400
6. Rheumatism and Gout	14	5	2	6	5		1			1				1	35
7. Diabetes	22	3	5	6	4	1	1	1	2	3	1		4	2	55
8. Other General Diseases	43	10	10	14	5	4	2	5	4	2	3	1	1	2	106
9. Alcoholism, Acute and Chronic	4		2												6
LOCAL DISEASES.															
III. DISEASES OF NERVOUS SYSTEM AND ORGANS OF SENSE.															
1. Encephalitis	8	2	1	3	1		4		1						20
2. Simple Meningitis	77	19	20	6	9	9	3	2		2	6	5	2	1	161
3. Epidemic Cerebro-spinal Meningitis	11	2	6						2		1	1			23
4. Congestion and Hemorrhage of Brain	135	44	29	20	10	9	8	11	4	13	4	7	1	6	301
5. Softening of the Brain	15	5	1	2		1	1			1	1	2	1	1	31
6. Paralysis without specified cause	109	19	32	18	22	12	4	8	6	2	5	2	8	2	249
7. Insanity	7		2												9
8. Epilepsy	6	2	2	1								1			12
9. Convulsions (puerperal)	89	7	30	15	4	6	6	6	5	4		3	2	3	180
10. Other Nervous Diseases	19	3		5	2	1	3	1	2		1	1	2	1	41
IV. DISEASES OF CIRCULATORY SYSTEM															
1. Pericarditis	8	1	1	1	1	1						1	1		15
2. Endocarditis	16	5	13	3	2	1		2	1	1					41
3. Organic Heart Diseases	276	54	51	41	30	14	11	15	20	16	6	13	10	19	576
4. Angina Pectoris	19	2	1	4			1	2		1			1	2	33
5. Diseases of Arteries, Atheroma, Aneurism, etc.	28	7	2	3		1			1			1			43
6. Other Diseases of Circulatory System			1	1											2
V. DISEASES OF THE RESPIRATORY SYSTEM.															
1. Acute Bronchitis	94	18	25	23	1		3	2	4		1	4	3		178
2. Chronic Bronchitis	13	12	9	2	1	3		1	1	1				1	44
3. Broncho-pneumonia	90	13	23	1	1	2	1	5			2	7		3	148
4. Pneumonia	204	78	73	44	19	22	11	3	9	30	4	9	13	14	533
5. Pleurisy	17	12	10	3	1	1		2	3			1	3	3	56
6. Cong. of the Lungs (inc. pulmonary apoplexy)	13	8	5	2	2			3	3	2		1		5	44
7. Asthma and Emphysema	10	2	2	4	1							1	1		21
8. Other Diseases of Respiratory System	1														1
VI. DISEASES OF THE DIGESTIVE SYSTEM.															
1. Ulcer of the Stomach	2	4	2	2		1					1			1	13
2. Other Diseases of Stomach (cancer excepted)	20	7	8	5	5	2	1		1	2		1	1		53
3. Infan. Diarr., gastro enteritis, Chol. Infantum	192	22	93	26	8	5	9	8	8	5	3	8	2	4	393
4. Diarrhœa and Enteritis (not infantile)	12	6	4	6	2	1		1	3	3	2	4			44
5. Dysentery	2			1		1	2								6
6. Hernia and Intestinal obstructions	18	4	8	7	5	5		2	1			2	1	1	54
7. Other Diseases of the Intestines	11	4	5	1	1	1	1					1		1	26
8. Diseases of the Liver	34	8	14	8	5	3	3		2	2	1	3	5	1	89
9. Peritonitis (not puerperal)	62	10	21	2	4	3	6	2	2		3	1	3	3	122
10. Iliac Abscess and Appendicitis	38	6	12	7	7	1	3	1	1		1		1	1	79

TABLE NO. 14.—*Continued.*

General Diseases	Toronto	Hamilton	Ottawa	London	Kingston	Brantford	St. Thomas	Guelph	St. Catharines	Belleville	Stratford	Windsor	Chatham	Woodstock	Totals
VII. DISEASES OF THE GENITO-URINARY SYSTEM															
1. Acute Nephritis	56	4	11	2		1				2			1	2	82
2. Bright's Disease	67	31	13	21	1	2	2		6	4	1	5	3	2	191
3. Other Diseases of Kidneys and Adnexa	7	1	2	10	2	1	2			1	1			1	28
4. Vesical Calculi	1														1
5. Diseases of the Bladder	12	6	4					2		2				1	33
6. Diseases of the Male Genital Organs	3	1	1			1			1						7
7. Metritis															
8. Other Diseases of the Uterus															
9. Ovarian Cysts and other Ovarian Tumors	3								1			1	1		6
10. Other Diseases of the Female Genital Organs	1	2		1											10
VIII. PUERPERAL DISEASES															
1. Puerperal Septicemia	2	2	1										1		6
2. Puerperal Albuminuria and Convulsions	12	1	4	1		1								1	20
3. Other Accidents of Pregnancy, sudden death	11		1	1			2		2	1				1	26
4. Puerperal Diseases of the Breast															
IX. DISEASES OF THE SKIN AND CELLULAR TISSUE.															
1. Erysipelas	10	7	3	3	1	1				2		1		1	28
2. Skin and Adnexa (cancer excepted)	5	1													7
X. DISEASES OF THE LOCOMOTOR SYSTEM.															
1. Pott's Disease	1		1												2
2. Diseases of Bones and Joints	3														4
3. Amputation (for unspecified disease)															
XI. MALFORMATIONS, DISEASES OF INFANCY, DISEASES OF OLD AGE.															
1. Still-Births	258	76	96	3	1	21	7	11	12	4	7	11	4	3	546
2. Congenital Debility and Malformations	412	62	144	57	30	7	5	1	16	8	7	19	12	17	856
3. Other Diseases of Infancy	10	2	1	1		1	1				1				27
4. Senile Decay	262	66	82	57	48	28	1	17	16	19	17	15	14	26	611
XII. SUICIDE.															
1. Poison			1	1										1	3
2. Strangulation	1	1													2
3. Gas Poisoning															
4. Drowning		1		1											2
5. Firearms	2														3
6. Other Methods		1													1
XIII. ACCIDENT.															
1. Fractures and Dislocations	20	1	1	8	2	1			2	1	1		1		47
2. Gunshot			2	2						1					5
3. Lightning															
4. Drowning	19	5		1	2	2		3	3	2	1				41
5. Electric Cars	14	3				1	1								19
6. Bicycles															
7. Railways	14	7	6	6	2			1				3	1	5	46
8. Burns and Scalds	19		7	1					4		1		1		32
9. Homicide	3			1								1			5
10. Other Accidents	56	9	10	4		1	8	5			1	1	2	2	103
11. Poison	12								2						15
12. Asphyxiation	12							1							13
XIV. ILL DEFINED CAUSES															
1. Dropsy	6	1	8	1			3			2	1	1	2	1	26
2. Tumors	30	12	11	1	3		2		1			2	1	3	77
3. Other Ill-Defined Causes	14	5	11	6		7	1	1	1	1	2	2	3	8	65
4. Heart Failure	41	14	26	8	7	1	3		1	1	2	6		2	119
5. Tetanus	2								1						3
Totals from all causes	3,866	928	1,234	650	360	273	173	169	199	173	116	195	156	190	8,742

TABLE No. 15.

Showing Deaths by Individual Diseases in 11 Towns in 1904.

General Diseases	Berlin.	Brockville.	Cornwall.	Lindsay	Niagara Falls.	Owen Sound.	Peterborough.	Kenora.	Sarnia.	Sault Ste. Marie.	Toronto Junction.	Totals.
I. Communicable (Epidemic) Diseases												
1. Typhoid Fever	1	6	3	3	1	3	7	7	3	2	8	44
2. Smallpox	...	...	...	...	...	...	...	...	...	...	...	...
3. Measles	1	...	...	...	...	...	...	...	...	...	...	1
4. Scarlet Fever	...	2	...	2	...	1	1	4	1	3	1	15
5. Whooping Cough	...	...	...	...	1	3	...	...	2	...	...	6
6. Diphtheria and Croup	4	5	1	...	3	2	12	5	1	...	11	44
7. Influenza	4	2	...	2	...	1	3	...	1	...	1	14
8. Other Epidemic Diseases	...	...	...	...	...	...	...	...	...	...	...	...
II. Other General Diseases												
1. Pyaemia and Septicemia	1	1	1	2	...	...	3	...	3	1	2	14
2. Malarial Fever	...	...	...	...	...	...	1	...	...	...	...	1
3. Tuberculosis and Scrofula	10	18	27	15	7	15	30	7	20	14	12	175
4. Syphilis	...	...	...	...	...	...	...	...	...	...	...	...
5. Cancer	7	5	5	5	...	10	7	3	11	5	6	64
6. Rheumatism and Gout	...	...	...	2	...	...	2	1	...	1	...	6
7. Diabetes	1	...	...	2	1	...	...	...	...	...	...	4
8. Other General Diseases	...	2	1	...	...	4	3	...	...	1	4	15
9. Alcoholism, Acute and Chronic	...	...	...	1	...	...	1	...	1	...	1	4
LOCAL DISEASES.												
III. Diseases of Nervous System and Organs of Sense.												
1. Encephalitis	...	...	1	...	1	...	1	...	...	...	1	4
2. Simple Meningitis	1	3	4	4	1	2	2	2	2	1	3	25
3. Epidemic Cerebro-spinal Meningitis	...	1	...	...	...	1	...	...	...	...	1	3
4. Congestion and Hemorrhage of the Brain	8	5	4	4	1	3	5	...	6	1	6	43
5. Softening of the Brain	1	...	...	...	...	...	1	...	...	...	1	3
6. Paralysis without specified cause	4	5	2	2	3	6	10	5	7	2	1	47
7. Insanity	...	...	1	...	...	...	1	...	...	...	...	2
8. Epilepsy	...	1	...	...	...	1	1	...	...	...	2	5
9. Convulsions (not puerperal)	6	1	2	3	2	4	1	3	4	1	7	34
10. Other Nervous Diseases	2	1	...	...	...	2	1	...	1	1	...	8
IV. Diseases of Circulatory System												
1. Pericarditis	...	...	...	...	...	...	...	...	...	2	...	2
2. Endocarditis	...	3	...	1	...	1	1	...	...	...	1	7
3. Organic Heart Diseases	12	11	5	6	...	20	15	4	4	6	8	91
4. Diseases of Angina Pectoris	...	1	1	...	...	...	1	...	...	...	1	4
5. Arteries, Atheroma, Aneurism, etc	1	...	1	...	...	...	1	...	...	...	1	4
6. Other Diseases of the Circulatory System	...	...	...	...	...	...	...	...	...	...	...	...
V. Diseases of the Respiratory System												
1. Acute Bronchitis	3	...	2	4	1	8	6	4	2	1	12	43
2. Chronic Bronchitis	1	...	1	1	...	...	1	...	...	1	...	5
3. Broncho-pneumonia	...	3	2	1	...	2	...	...	3	...	6	17
4. Pneumonia	3	8	7	6	11	8	14	7	7	9	7	87
5. Pleurisy	...	1	2	1	...	1	1	1	1	...	2	10
6. Congestion of the Lungs (inc. pulmonary apoplexy)	3	1	...	1	...	2	...	1	...	1	3	12
7. Asthma and Emphysema	...	...	...	...	...	...	...	...	1	...	...	1
8. Other Diseases of the Respiratory System	...	...	...	...	...	...	...	...	...	1	...	1
VI. Diseases of the Digestive System												
1. Ulcer of the Stomach	1	...	...	...	...	1	1	...	1	...	...	4
2. Other Diseases of Stomach (cancer excepted)	...	4	1	1	...	3	1	...	...	...	2	12
3. Infant Diarrhœa & Gastro enteritis (Cholera Infantum)	2	7	...	...	4	7	6	3	7	4	4	44
4. Diarrhœa and Enteritis (not infantile)	2	...	1	1	1	...	1	...	1	...	1	8
5. Dysentery	...	2	...	...	2	...	...	1	...	...	...	5
6. Hernia and Intestinal obstructions	1	...	1	1	...	1	1	...	...	...	1	6
7. Other Diseases of the Intestines	1	1	1	...	...	1	...	...	...	...	...	4
8. Diseases of the Liver	1	2	...	1	1	1	2	...	2	1	...	11
9. Peritonitis (not Puerperal)	...	1	1	2	...	2	...	...	3	1	3	13
10. Iliac Abscess (typhylitis, perityphylitis & appendicitis)	1	...	3	3	2	1	2	...	...	2	...	14

TABLE No. 15.—*Continued.*

Showing total Deaths by Individual Diseases in 11 Towns in 1904.—*Continued.*

General Diseases.	Berlin.	Brockville.	Cornwall.	Lindsay.	Niagara Falls.	Owen Sound.	Peterborough.	Kenora.	Sarnia.	Sault Ste. Marie.	Toronto Junction.	Totals.
VII. DISEASES OF THE GENITO-URINARY SYSTEM.												
1. Acute Nephritis			1				4				4	12
2. Bright's Disease	2	2	2	2	1		7		4	2	3	25
3. Other Diseases of the Kidneys and Adnexa			2		1	2			1			7
4. Vesical Calculi												
5. Diseases of the Bladder					2		1			1		7
6. Diseases of the Male Genital Organs				1			1					2
7. Metritis												
8. Other Diseases of the Uterus												
9. Ovarian Cysts and other Ovarian Tumors										1		1
10. Other Diseases of the Female Genital Organs							1				2	3
VIII. PUERPERAL DISEASES.												
1. Puerperal Septicemia										1		1
2. Puerperal Albuminuria and Convulsions			1				2					3
3. Other Accidents of Pregnancy, sudden death		1			1					2	2	6
4. Puerperal Diseases of the Breast												
IX. DISEASES OF THE SKIN AND CELLULAR TISSUE.												
1. Erysipelas						1					1	2
2. Other Diseases of Skin and its adnexa (Cancer excepted)												
X. DISEASES OF THE LOCOMOTOR SYSTEM.												
1. Pott's Disease												
2. Diseases of the Bones and Joints												
3. Amputation (for unspecified diseases)												
XI. MALFORMATIONS, DISEASES OF INFANCY, DISEASES OF OLD AGE.												
1. Still-Births	4	13	5	2	8	8	17		5	10	14	86
2. Congenital Debility and Malformations	11	17	9	8	14	13	25	8	10	11	23	149
3. Other Diseases of Infancy	2			2							1	5
4. Senile Decay	17	17	25	14	11	25	23	7	13	5	5	160
XII. SUICIDE.												
1. Poison							2					2
2. Strangulation	1					1						2
3. Gas Poisoning												
4. Drowning				1								1
5. Firearms												
6. Other methods	2			1	1				2			6
XIII. ACCIDENT.												
1. Fractures and Dislocations	2	2	1		4				2	2	1	14
2. Gunshot		2				1			1	1	1	6
3. Lightning										1		1
4. Drowning	1		4	2		4		5	3	4		23
5. Electric Cars	1											1
6. Bicycles												
7. Railways	1			2	3		1	7	1	1	3	19
8. Burns and Scalds	2		2								1	5
9. Homicide												
10. Other accidents	1	1			3	5	7	6	2	3	3	31
11. Poison		1								1		2
12. Asphyxiation					2				5			7
XIV. ILL-DEFINED CAUSES.												
1. Dropsy	1			1		1	2	1	2		2	10
2. Tumors		1		1			1		2		2	7
3. Other Ill-Defined Causes		5	2	1	2	5	1	2	4	1	2	25
4. Heart Failure		1		2	5	1	2	4	2	4	3	27
5. Tetanus												
Totals	134	170	133	118	101	185	247	98	154	115	189	1,644

APPENDIX.

BIRTHS BY MONTHS, 1904—COUNTIES.

Counties.	Jan'ary.	Feb'ry.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of pairs of twins	Triplets.	Illegitimate.	Still born.
Algoma :																	
Males	51	51	72	84	68	46	65	66	54	63	53	66	739	12	....	7	13
Females	61	68	86	71	54	61	63	54	41	42	52	49	702	14	....	11	7
Total	112	119	158	155	122	107	128	120	95	105	105	115	1,441	13 pair	....	18	20
Brant :																	
Males	35	26	30	36	49	40	28	28	42	28	42	24	408	6	....	7	24
Females	46	27	38	26	26	39	32	31	31	27	26	24	373	6	....	5	12
Total	81	53	68	62	75	79	60	59	73	55	68	48	781	6 pair	....	12	36
Bruce :																	
Males	43	57	56	62	65	66	46	59	56	47	50	55	662	20	....	6	15
Females	52	62	54	58	59	63	45	59	53	56	31	46	638	20	....	5	9
Total	95	119	110	120	124	129	91	118	109	103	81	101	1,300	20 pair	....	11	24
Carleton :																	
Males	89	97	110	107	102	71	90	79	92	94	70	80	1,081	26	....	90	15
Females	104	98	106	108	112	117	104	88	87	98	76	102	1,200	20	3	91	10
Total	193	195	216	215	214	188	194	167	179	192	146	182	2,281	23 pair	1 case	181	25
Dufferin :																	
Males	14	16	24	34	22	28	29	17	25	12	21	10	252	7	....	1	6
Females	16	24	20	19	11	17	16	26	19	12	13	8	201	5	....	1	4
Total	30	40	44	53	33	45	45	43	44	24	34	18	453	6 pair	....	2	10
Elgin :																	
Males	36	39	42	33	34	29	31	38	32	26	38	29	407	7	....	3	9
Females	28	25	33	33	30	30	35	40	42	30	25	27	378	5	....	2	9
Total	64	64	75	66	64	59	66	78	74	56	63	56	785	6 pair	....	5	18
Essex :																	
Males	66	58	76	74	84	65	64	73	62	67	59	59	807	15	....	5	24
Females	76	66	73	69	56	67	73	66	64	76	46	63	795	11	....	6	19
Total	142	124	149	143	140	132	137	139	126	143	105	122	1,602	13 pair	....	11	43

Frontenac:																	
Males	23	87	42	42	29	47	45	40	45	29	34	34	447	9		....	15	9
Females	29	50	45	33	38	36	34	45	48	27	36	31	452	15		....	13	8
Total	52	87	87	75	67	83	79	85	93	56	70	65	899	12	pair	....	28	17
Grey:																	
Males	53	58	62	86	73	65	58	74	73	71	60	62	795	20		....	6	20
Females	47	50	61	60	62	71	63	69	63	61	54	63	724	16		....	4	17
Total	100	108	123	146	135	136	121	143	136	132	114	125	1,519	18	pair	....	10	37
Haldimand:																	
Males	23	9	18	22	29	19	21	27	17	21	13	16	238	10		....	3	4
Females	18	16	17	21	17	12	15	11	20	10	12	13	182	8		....	2	5
Total	41	25	35	43	46	31	36	38	37	34	25	29	420	9	pair	....	5	9
Halton:																	
Males	13	20	19	19	13	17	13	15	22	17	14	21	203	3		....	2	3
Females	20	19	13	11	17	21	18	15	22	17	13	18	204	11		....	2	3
Total	33	39	32	30	30	38	31	30	44	34	27	39	407	7	pair	....	4	6
Haliburton:																	
Males	6	10	9	15	11	12	8	15	9	7	10	6	118	4		....	1	3
Females	9	9	11	8	12	8	8	10	14	11	7	8	115	4		....	1	2
Total	15	19	20	23	23	20	16	25	23	18	17	14	233	4	pair	....	2	5
Hastings:																	
Males	53	53	52	80	56	53	61	64	44	49	38	37	640	15		....	8	12
Females	42	59	40	52	55	46	55	69	53	46	36	36	589	11		....	6	17
Total	95	112	92	132	111	99	116	133	97	95	74	73	1,229	13	pair	....	14	29
Huron:																	
Males	40	49	51	50	67	53	34	55	57	51	50	43	600	13		....	7	15
Females	46	35	37	52	51	48	40	55	44	38	36	39	521	11		....	6	10
Total	86	84	88	102	118	101	74	110	101	89	86	82	1,121	1	pair	....	13	25
Kent:																	
Males	38	46	48	71	63	58	46	45	49	41	52	56	616	13		....	3	7
Females	42	55	40	56	56	43	47	46	50	38	37	48	558	17		....	3	13
Total	80	101	88	127	119	101	93	91	99	82	89	104	1,174	15	pair	....	6	20

BIRTHS BY MONTHS, 1904—COUNTIES.—*Continued.*

Counties.	Jan'ary.	Feb'ry.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of Pairs of Twins.	Triplets.	Illegitimate.	Still born.
Lambton :																	
Males	51	55	39	54	51	47	50	56	49	50	43	35	580	13	....	3	15
Females	35	53	48	34	54	46	47	35	62	51	44	44	556	13	....	7	11
Total	86	108	87	88	105	93	97	91	111	104	87	79	1,136	13 pair	....	10	26
Lanark :																	
Males	32	20	41	18	27	39	41	37	26	32	21	23	357	5	....	6	12
Females	33	30	37	29	30	32	33	31	33	21	25	24	358	15	....	4	9
Total	65	50	78	47	57	71	74	68	59	53	46	47	715	10 pair	....	10	21
Leeds and Grenville :																	
Males	50	39	61	55	41	58	57	49	49	52	38	41	590	8	....	8	15
Females	41	42	51	53	58	56	62	42	33	44	32	36	550	18	....	5	10
Total	91	81	112	108	99	114	119	91	82	96	70	77	1,140	13 pair	....	13	25
Lennox and Addington :																	
Males	22	16	17	24	10	17	17	22	16	12	20	12	205	5	3	2	8
Females	11	26	16	30	13	21	20	21	9	15	9	14	205	9	....	2	4
Total	33	42	33	54	23	38	37	43	25	27	29	26	410	7 pair	1 case	4	12
Lincoln :																	
Males	20	31	29	20	27	12	25	33	28	29	22	26	302	7	....	4	10
Females	18	22	25	24	25	27	31	17	25	13	25	13	265	5	....	3	14
Total	38	53	54	44	52	39	56	50	53	42	17	39	567	6 pair	....	7	24
Middlesex :																	
Males	81	79	100	83	88	83	82	77	91	70	72	82	988	16	....	16	46
Females	75	71	99	79	80	83	72	80	79	82	65	64	929	20	....	20	28
Total	156	150	199	162	168	166	154	157	170	152	137	146	1,917	18 pair	....	36	74
Muskoka :																	
Males	23	24	36	25	25	26	29	17	25	24	28	38	320	13	....	3	11
Females	21	21	30	46	29	28	32	23	24	22	17	30	323	11	....	2	6
Total	44	45	66	71	54	54	61	40	49	46	45	68	643	12 pair	....	5	17

Norfolk:																	
Males	26	24	29	24	31	26	22	28	27	21	21	28	307	10	....	9	10
Females	15	22	28	20	37	28	30	26	22	21	20	15	284	4	....	1	5
Total	41	46	57	44	68	54	52	51	49	42	41	43	591	7 pair	....	10	15
Northumberland and Durham:																	
Males	52	49	55	55	68	40	53	55	51	44	45	33	600	10	....	6	14
Females	48	47	50	42	46	65	52	43	48	42	52	34	569	14	....	4	13
Total	100	96	105	97	114	105	105	98	99	86	97	67	1,169	12 pair	....	10	27
Nipissing:																	
Males	48	48	72	57	66	61	61	55	63	36	39	39	645	15	....	7	15
Females	65	67	70	54	57	49	61	75	43	50	34	48	676	15	....	3	11
Total	113	115	142	111	123	110	125	130	106	86	73	87	1,321	15 pair	....	10	26
Ontario:																	
Males	26	45	53	54	52	42	48	42	40	27	33	37	499	10	....	4	10
Females	33	35	42	45	51	39	34	42	37	34	23	44	459	10	....	7	7
Total	59	80	95	99	103	81	82	84	77	61	56	81	958	10 pair	....	11	17
Oxford:																	
Males	39	33	51	42	52	43	38	41	42	43	34	40	501	11	....	1	12
Females	32	34	43	30	51	39	46	45	36	44	43	32	475	15	....	5	9
Total	71	67	97	72	103	82	84	86	78	87	77	72	976	13 pair	....	6	21
Parry Sound:																	
Males	37	33	42	40	42	36	31	32	36	26	26	32	413	8	....	6	7
Females	29	41	31	40	33	31	29	28	25	22	21	28	358	4	....	2	6
Total	66	71	73	80	75	67	60	60	61	48	47	60	771	6 pair	....	8	13
Peel:																	
Males	21	9	14	11	6	11	20	19	10	7	11	7	149	....	....	......	2
Females	11	19	22	11	14	12	10	20	20	16	14	10	179	....	....	1	2
Total	32	28	36	25	20	23	30	39	30	23	25	17	328	....	....	1	4
Perth:																	
Males	52	45	43	46	59	52	37	49	45	37	36	51	552	9	....	2	6
Females	27	48	43	41	51	36	37	33	44	53	24	45	482	13	....	5	11
Total	79	93	86	87	110	88	74	82	89	90	60	96	1,034	11 pair	....	7	17

BIRTHS BY MONTHS, 1904.—COUNTIES.—*Continued.*

Counties.	Janu'ry.	Feb'ry.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of pair of twins.	Triplets.	Illegitimate.	Still Born.
Peterborough :																	
Males	30	28	27	59	48	33	27	43	51	32	38	34	450	9	....	3	17
Females	41	37	33	49	38	36	34	37	37	35	23	41	441	13	....	3	12
Total	71	65	60	108	86	69	61	80	88	67	61	75	891	11 pair	....	6	29
Prescott and Russell :																	
Males	71	76	78	76	75	70	84	61	75	62	69	79	876	25	7	2	15
Females	86	73	99	79	74	71	84	62	62	74	60	75	899	19	8	3	13
Total	157	149	177	155	149	141	168	123	137	136	129	154	1,775	22 pair	5 cases	5	28
Prince Edward :																	
Males	18	8	15	16	9	12	19	12	10	15	5	14	153	6	....	......	5
Females	10	10	10	8	11	4	10	12	12	9	10	11	117	2	....	2	3
Total	28	18	25	24	20	16	29	24	22	24	15	25	270	4 pair	....	2	8
Rainy River :																	
Males	18	11	11	17	16	16	16	21	13	13	9	14	175	6	....	1	2
Females	11	17	13	14	10	16	26	13	8	16	9	15	168	8	....	1	2
Total	29	28	24	31	26	32	42	34	21	29	18	29	343	7 pair	....	2	4
Renfrew :																	
Males	61	81	86	57	75	57	73	57	76	44	48	51	766	14	....	4	18
Females	51	64	70	59	60	60	65	61	64	52	33	60	699	20	....	3	11
Total	112	145	156	116	135	117	138	118	140	96	81	111	1,465	17 pair	....	7	29
Simcoe :																	
Males	71	80	91	85	91	82	62	83	82	74	75	74	950	16	....	5	23
Females	84	69	95	106	93	75	83	83	75	74	78	72	987	22	....	6	26
Total	155	149	186	191	184	157	145	166	157	148	153	146	1,937	19 pair	....	11	49
Stormont, Dundas & Glen :																	
Males	61	57	59	65	74	67	85	66	69	67	65	60	795	16	....	5	14
Females	61	57	70	43	69	61	65	88	87	65	56	64	786	18	....	3	13
Total	122	114	129	108	143	128	150	154	156	132	121	124	1,581	17 pair	....	8	27

Thunder Bay:																	
Males	19	18	34	21	20	39	24	22	18	18	17	23	273	4		4	5
Females	18	18	20	14	22	26	9	18	17	21	21	16	220	2		3	6
Total	37	36	54	35	42	65	33	40	35	39	38	39	493	3 pair		7	11
Victoria:																	
Males	21	22	29	23	38	36	25	30	22	36	27	24	333	10			6
Females	16	24	27	34	28	19	31	23	25	33	26	29	315	10		2	5
Total	37	46	56	57	66	55	56	53	47	69	53	53	648	10 pair		2	11
Waterloo:																	
Males	46	56	63	48	63	56	57	60	44	47	48	40	628	15		6	9
Females	43	43	39	35	41	48	56	65	50	38	55	49	562	3		6	11
Total	89	99	102	83	104	104	113	125	94	85	103	89	1,190	9 pair		12	20
Welland:																	
Males	22	35	29	29	22	23	34	31	26	33	20	33	337	11			8
Females	23	29	37	26	25	23	30	33	25	33	18	22	324	7		1	13
Total	45	64	66	55	47	46	64	64	51	66	38	55	661	9 pair		1	21
Wellington:																	
Males	54	45	40	60	47	45	54	55	15	34	30	39	548	15		2	18
Females	49	39	15	48	50	56	43	56	39	30	42	41	538	17		2	14
Total	103	84	85	108	97	101	97	111	84	64	72	80	1,086	16 pair		4	32
Wentworth:																	
Males	86	55	74	68	100	97	65	90	59	67	69	81	911	14		8	37
Females	86	64	73	69	69	80	70	85	65	60	62	58	841	4		7	24
Total	172	119	147	137	169	177	135	175	124	127	131	139	1,752	9 pair		15	61
York:																	
Males	274	277	300	285	333	289	336	309	274	259	249	285	3,470	69		120	76
Females	296	294	310	254	288	246	316	278	274	277	257	292	3,382	63		126	58
Total	570	571	610	539	621	535	652	587	548	536	506	577	6,852	66 pair		246	134
Total Males	2,015	2,025	2,332	2,335	2,421	2,184	2,211	2,247	2,141	1,940	1,862	1,973	25,686	550	10	401	625
Total Females	2,005	2,079	2,250	2,093	2,163	2,092	2,169	2,159	2,031	1,939	1,698	1,901	24,579	548	11	397	482
Grand total	4,020	4,104	4,582	4,428	4,584	4,276	4,380	4,406	4,172	3,879	3,560	3,874	50,265	549 pair	7 cases	798	1,107

BIRTHS BY MONTHS, 1904—CITIES.

Cities.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of pair of twins.	Triplets.	Illegitimate.	Still born.
Toronto:																	
Males	221	208	228	218	254	230	245	233	216	207	193	216	2,672	53	....	108	59
Females	231	222	246	192	226	187	246	209	205	216	197	237	2,611	53	....	117	45
Total	455	430	474	410	480	417	491	442	421	423	390	453	5,286	53 pair.	....	225	104
Hamilton:																	
Males	55	48	53	48	47	49	43	63	41	49	49	61	609	6	....	8	31
Females	67	50	47	48	46	48	55	63	44	43	46	39	596	2	....	8	20
Total	122	98	100	96	93	97	98	126	88	92	95	100	1,205	4 pair.	....	16	51
Ottawa:																	
Males	59	67	79	73	69	51	65	50	65	70	43	50	741	11	1	85	4
Females	71	74	82	82	79	82	79	62	58	74	52	61	856	7	2	88	3
Total	130	141	161	155	148	133	144	112	123	144	95	111	1,597	9 pair.	1 case.	173	7
London:																	
Males	37	38	40	41	40	14	47	42	47	35	37	31	479	9	....	10	27
Females	40	34	44	38	40	43	38	38	37	38	44	30	464	7	....	17	16
Total	77	72	84	79	80	87	85	80	84	73	81	61	943	8 pair.	....	27	43
Kingston:																	
Males	8	18	15	19	16	20	21	18	21	10	11	15	192	7	....	9	2
Females	18	17	18	16	12	17	17	20	29	10	13	11	198	9	....	5	2
Total	26	35	33	35	28	37	38	38	50	20	24	26	390	8 pair.	....	14	4
Brantford:																	
Males	15	16	13	24	30	20	19	14	14	9	23	19	216	3	....	3	9
Females	24	17	20	15	16	21	16	16	18	20	13	17	213	3	....	2	8
Total	39	33	33	39	46	41	35	30	32	29	36	36	429	3 pair.	....	5	17
St. Thomas:																	
Males	14	15	9	9	5	9	9	15	11	10	15	8	129	2	....	......	7
Females	12	6	10	7	8	6	8	9	14	10	9	7	106	....	....	1	2
Total	26	21	19	16	13	15	17	24	25	20	24	15	235	1 pair.	....	1	9

Guelph :																	
Males	15	13	11	20	11	15	16	10	11	9	9	12	152	4	......	......	4
Females	13	9	13	12	13	8	11	12	6	7	7	7	118	6	......	......	3
Total	28	22	24	32	24	23	27	22	17	16	16	19	270	5 pair.	......	......	7
St. Catharines																	
Males	5	5	7	5	10	7	8	10	14	13	6	8	98	......	......	4	1
Females	5	7	10	6	9	12	12	8	11	1	11	3	95	4	......	2	4
Total	10	12	17	11	19	19	20	18	25	14	17	11	193	2 pair.	......	6	5
Belleville																	
Males	10	11	2	13	5	12	7	8	9	3	4	6	90	1	......	2	3
Females	4	8	10	10	6	7	1	5	9	8	3	3	77	1	......	......	2
Total	14	19	12	23	11	19	11	13	18	11	7	9	167	1 pair.	......	2	5
Stratford :																	
Males	10	15	16	16	13	13	8	19	8	6	9	10	143	4	......	1	......
Females	5	10	10	4	8	8	8	9	8	7	5	8	90	2	......	1	......
Total	15	25	26	20	21	21	16	28	16	13	14	18	233	3 pair.	......	2	......
Windsor :																	
Males	11	8	10	18	13	11	14	13	13	13	12	12	148	......	......	1	......
Females	5	9	11	14	9	15	19	14	10	15	12	9	142	6	......	......	......
Total	16	17	21	32	22	26	33	27	23	28	24	21	290	3 pair.	......	1	......
Chatham :																	
Males	8	4	7	7	12	2	10	4	6	6	4	5	75	3	......	......	......
Females	5	6	6	6	7	6	8	4	5	13	7	8	81	1	......	2	......
Total	13	10	13	13	19	8	18	8	11	19	11	13	156	2 pair.	......	2	......
Woodstock :																	
Males	7	6	8	8	7	4	7	9	7	4	6	4	77	3	......	......	3
Females	5	7	5	6	9	9	8	6	6	5	8	8	82	5	......	......	1
Total	12	13	13	14	16	13	15	15	13	9	14	12	159	4 pair.	......	......	4
Total Male	478	472	498	519	532	487	519	508	486	444	421	457	5,821	106	......	231	150
Total Females	505	476	532	456	488	469	529	475	460	467	427	418	5,732	106	......	243	106
Grand Total	983	948	1,030	975	1,020	956	1,048	983	946	911	848	905	11,553	106	1 case	474	256

MARRIAGES BY MONTHS, 1904.—COUNTIES.

Counties.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	No Date.	Totals.
Algoma	32	31	22	21	18	46	33	42	36	37	57	23	3	401
Brant	11	15	18	22	9	46	14	19	35	15	35	32	......	271
Bruce	29	32	32	22	24	70	27	16	34	27	42	62	......	417
Carleton	52	45	24	68	43	153	55	76	110	84	70	48	3	831
Dufferin	16	19	11	11	7	28	11	5	12	10	8	22	......	160
Elgin	28	20	26	20	19	56	18	23	33	30	30	50	......	353
Essex	99	76	92	146	120	181	148	130	182	110	120	161	....	1,595
Frontenac	19	29	26	27	17	44	28	34	29	36	23	36	1	349
Grey	34	32	50	31	18	85	23	36	56	48	55	76	2	546
Haldimand	8	15	10	6	8	34	10	8	22	22	13	33	......	189
Halton	8	10	5	9	5	22	3	10	25	5	13	18	1	134
Haliburton	4	2	5	2	3	14	2	2	4	5	3	4	.....	50
Hastings	32	23	37	36	16	66	24	32	44	42	42	66	1	461
Huron	34	37	27	23	20	84	17	33	32	26	34	61	.....	428
Kent	29	88	25	45	28	46	24	27	30	38	53	65	5	453
Lambton	34	26	29	34	28	67	18	39	45	41	48	69	1	479
Lanark	21	16	19	34	16	39	4	18	31	33	20	22	1	274
Leeds and Grenville	41	33	31	34	21	60	28	33	47	39	40	45	....	452
Lennox and Addington	22	13	13	17	4	22	7	10	23	13	16	26	.....	186
Lincoln	14	17	13	29	9	29	12	25	21	21	17	25	......	232
Middlesex	34	52	54	72	42	122	38	52	84	73	82	99	.....	804
Muskoka	6	9	17	12	15	28	7	17	14	15	16	26	1	183
Nipissing	16	19	14	22	14	30	33	36	19	18	25	13	.....	259
Norfolk	12	10	29	18	9	21	9	8	19	22	25	25	6	213
Northumberland and Durham	29	29	54	38	20	63	20	28	35	35	31	72	......	454
Ontario	34	21	27	18	13	42	17	17	13	19	25	42	2	290
Oxford	28	28	25	26	16	57	16	25	39	31	25	46	......	362
Parry Sound	14	7	16	12	10	21	8	18	22	10	11	7	.....	156
Peel	9	15	16	7	3	36	8	9	14	4	14	29	1	165
Perth	35	23	35	34	15	60	14	15	36	34	33	50	2	386
Peterborough	28	24	23	24	17	44	14	19	43	27	37	37	......	337
Prescott and Russell	32	30	7	30	28	48	29	36	59	34	15	8	2	358
Prince Edward	7	8	9	10	10	13	2	9	11	12	15	18	.....	124

Rainy River	9	3	9	5	7	11	13	12	13	12	12	5	....	111
Renfrew	24	25	18	35	19	70	34	37	48	28	37	24	1	400
Simcoe	65	45	52	44	27	84	32	44	70	68	56	72	1	660
Stormont, Dundas and Glengarry	40	40	27	33	23	65	17	28	76	45	44	31	1	470
Thunder Bay	23	12	10	10	12	16	30	20	18	18	21	8	....	198
Victoria	32	19	20	27	15	44	16	11	26	22	31	38	....	301
Waterloo	33	27	29	43	33	64	16	20	41	45	44	55	1	451
Welland	30	20	20	14	22	44	32	32	40	36	30	34	....	354
Wellington	33	35	31	26	17	84	26	20	36	33	24	47	....	412
Wentworth	41	36	39	66	35	125	41	61	90	73	80	84	1	772
York	177	165	187	234	186	589	195	279	384	329	269	314	....	3,308
Totals	1,358	1,231	1,283	1,497	1,041	2,973	1,173	1,471	2,101	1,755	1,741	2,128	37	19,789

MARRIAGES BY DENOMINATIONS AND AGES, 1904.

Sex.	Religious denomination of bride and bridegroom. Episcopalians.	Presbyterians.	Methodists.	Roman Catholics.	Baptists.	Congregationalists.	Lutherans.	Evangelical Association.	Quakers.	Mennonites.	Other denominations.	No denomination given.	How married. License.	Banns.	Totals.	Counties.	Ages. Under 20 years of age.	From 20 to 24 years.	From 25 to 29 years.	From 30 to 34 years.	From 35 to 39 years.	From 40 to 44 years.	From 45 to 49 years.	From 50 to 54 years.	From 55 to 59 years.	From 60 to 64 years.	From 65 to 69.	70 years and over.	Ages not given.
Males	67	94	78	131	10	2	8	....	..	....	3	8	....	....	401	Algoma	9	136	122	62	26	19	10	4	1	2	2	1	7
Females ..	64	90	80	133	13	3	8	..	.	....	5	5	....	....	401		113	154	64	23	15	8	4	1	1	2	..	.	16
Total....	131	184	158	264	23	5	16	....	..	....	8	13	317	84	802		122	290	186	85	41	27	14	5	2	4	2	1	23
Males	30	49	110	13	59	7	1	1	..	....	....	1	....	....	271	Brant............	6	105	79	31	16	17	6	4	....	1	2	3	1
Females ..	31	51	100	13	63	12	....	....	..	....	....	1	....	....	271		52	107	56	20	21	6	2	1	....	....	1	2	3
Total ...	61	100	210	26	122	19	1	1	..	....	....	2	270	1	542		58	212	135	51	37	23	8	5	....	1	3	5	4
Males......	42	155	117	54	14	1	12	11	..	2	9	...	....	....	417	Bruce	2	115	136	74	45	16	11	6	2	5	2	.	4
Females ..	41	140	129	51	19	....	9	14	..	1	10	3	....	....	417		53	168	101	46	24	4	8	2	1	1	2	..	7
Total....	83	295	246	105	33	1	21	25	..	3	19	3	371	46	834		55	283	237	120	69	19	19	8	3	6	4	..	11
Males	167	158	124	320	9	1	18	....	..	....	18	16	....	..	831	Carleton	16	214	276	144	64	33	16	11	7	7	5	1	7
Females ..	162	131	108	361	20	5	18	....	..	....	17	9	....	....	831		119	358	191	64	28	20	15	6	3	2	..	..	25
Total	329	289	232	681	29	6	36	....	..	....	35	25	659	172	1,662		135	602	467	208	92	53	31	17	10	9	5	1	32
Males.....	31	59	55	...	2	....	....	2	..	1	10	....	....	....	160	Dufferin	1	56	52	21	17	5	3	2	....	....	..	..	3
Females ..	32	60	54	......	4	1	....	....	.	2	7	....	....	....	160		18	73	40	11	7	2	3	....	....	....	1	..	5
Total. ..	63	119	109	......	6	1	....	2	..	3	17	....	159	1	320		19	129	92	32	24	7	[illegible]	2	....	....	1	..	8
Males......	46	7	140	5	64	4	1	2	..	1	15	5	....	....	353	Elgin	5	116	114	66	16	14	11	2	3	3	..	2	1
Females ..	42	6	153	8	61	4	....	....	.	3	20	1	....	....	353		70	136	89	27	13	4	7	2	....	....	..	..	5
Total....	88	13	293	13	125	8	1	2	..	4	35	6	351	2	706		75	252	203	93	29	18	18	4	3	3	..	2	6
Males......	198	17	477	321	165	44	89	5	..	....	67	53	....	....	1,595	Essex	36	630	405	211	123	85	46	24	14	9	6	2	4
Females ..	201	6	515	302	163	34	103	4	..	....	68	36	....	....	1,595		356	627	287	140	87	43	24	11	10	3	4	..	3
Total....	399	315	992	623	328	78	192	9	..	....	135	89	1,497	98	3,190		392	1,257	692	351	210	128	70	35	24	12	10	2	7

Males	72	44	149	59	4	6	....	....	4	....	7	4	......	......	349	Frontenac	1	121	106	56	27	12	9	7	3	2	..	1	4
Females	74	43	153	66	2	3	....	....	4	....	4	....	......	......	349		56	143	79	26	19	5	6	1	1	....	2	..	11
Total	146	87	302	125	6	9	....	....	8	....	11	4	328	21	698		57	264	185	82	46	17	15	8	4	2	2	1	15
Males	50	195	190	35	30	....	27	4	..	3	8	4	......	......	516	Grey	1	154	204	83	52	23	9	5	3	2	2	3	5
Females	52	176	200	27	31	....	35	5	1	4	9	6	....	....	546		74	229	143	46	22	13	4	2	1	1	2	..	9
Total	102	371	390	62	61	....	62	9	1	7	17	10	512	34	1,092		75	383	347	129	74	36	13	7	4	3	4	3	14
Males	24	29	73	9	31	...	4	7	..	....	10	2	......	....	189	Haldimand	3	68	55	30	14	3	6	5	2	....	1	1	1
Females	29	26	64	10	32	....	6	7	..	1	13	1	......	...	189		31	82	44	13	6	5	2	2	....	....	1	..	3
Total	53	55	137	19	63	....	10	14	.	1	23	3	183	6	378		34	150	99	43	20	8	8	7	2	....	2	1	4
Males	22	52	46	1	5	4	1	....	..	....	1	2	....	....	134	Halton	1	27	43	29	11	11	2	2	1	....	5	..	2
Females	18	55	50	1	2	4	....	....	.	....	1	3	......	......	134		9	46	40	8	9	8	2	2	1	....	5	.	4
Total	40	107	96	2	7	8	1	....	.	....	2	5	132	2	268		10	73	83	37	20	19	4	4	2	....	10	..	6
Males	18	11	17	......	3	....	....	....	..	....	1	....	......	....	50	Haliburton	1	14	22	9	1	1	1	....	....	1	.		....
Females	21	10	15	......	1	....	....	....	..	....	3	....	......	......	50		19	21	7	1	1	......	....	1	....	....	.		....
Total	39	21	32	......	4	....	....	....	..	....	4	....	50	......	100		20	35	29	10	2	1	1	1	....	1	.	..	...
Males	72	64	250	58	3	...	....	1	1	...	11	1	....	....	461	Hastings	9	149	151	54	35	20	12	10	4	5	5	4	3
Females	77	56	242	62	9	....	....	3	.	....	10	2	....	...	461		86	193	103	29	9	14	9	3	2	2	3	1	7
Total	149	120	492	120	12	...	....	4	1	....	21	3	411	50	922		95	312	251	83	44	34	21	13	6	7	8	5	10
Males	40	160	160	32	11	2	6	11	.	....	4	2	....	..	428	Huron	4	88	157	90	42	21	5	4	2	5	4	3	3
Females	40	169	156	29	9	3	7	11	..	....	2	2	....	....	428		37	170	139	42	16	5	2	3	5	1	1	.	7
Total	80	329	316	61	20	5	13	22	.	....	6	4	400	28	856		41	258	296	132	58	26	7	7	7	6	5	3	10
Males	54	72	185	59	56	3	1	....	.	....	11	12	.	....	453	Kent	10	150	148	70	26	19	8	5	1	2	4	2	8
Females	39	84	179	62	62	....	..	....	.	....	16	11	......	....	453		103	180	81	40	19	9	2	1	1	1	1	.	15
Total	93	156	364	121	118	3	1	..	.	....	27	23	411	42	906		113	330	229	110	45	28	10	6	2	3	5	2	23
Males	63	112	204	33	44	7	4	1	.	....	4	7	......	......	479	Lambton	4	161	150	71	48	15	12	5	8	2	..	1	2
Females	58	118	194	40	43	8	2	1	..	1	5	9	......	...	479		87	196	110	40	20	8	2	7	1	1	..	1	6
Total	121	230	398	73	87	15	6	2	..	1	9	16	458	21	958		91	357	260	111	68	23	14	12	9	3	..	2	8

MARRIAGES BY DENOMINATIONS AND AGES, 1904.

Counties	Sex	Episcopalians	Presbyterians	Methodists	Roman Catholics	Baptists	Congregationalists	Lutherans	Evangelical Association	Quakers	Mennonites	Other denominations	No denomination given	License	Banns	Totals
		Religious Denomination of bride and bridegroom.												How married.		
Lanark	Males	62	91	54	48	8	3	....	....		...	6	2	......	.....	274
	Females	52	95	57	49	12	3	....	....		...	1	5	......	.....	274
	Total	114	186	111	97	20	6	....	....		..	7	7	211	33	548
...nville	Males	90	76	208	52	17	1	...	1	.	....	5	3	......	.....	452
	Females	84	81	205	63	13	....	1	....	..	....	3	2	......	.....	452
	Total	174	156	413	115	30	1	1	1	.	....	8	5	430	22	904
Lennox and Addington	Males	30	18	112	14	1	1	....	....	1	....	7	2	......	.....	186
	Females	25	22	113	17	1	....	....	....	1	....	6	1	......	.....	186
	Total	55	40	225	31	2	1	....	....	2	....	13	3	176	10	372
Lincoln	Males	42	48	84	20	11	2	1	5	..	3	10	3	......	.....	232
	Females	47	35	80	24	11	2	1	11	.	2	17	2	......	.....	232
	Total	89	83	164	44	25	4	2	16	..	5	27	5	215	17	464
Middlesex	Males	178	178	290	45	72	3	4	....	2	...	21	11	......	.....	801
	Females	180	160	292	43	86	3	6	....	1	....	20	13	......	.....	801
	Total	258	338	582	88	158	6	10	....	3	...	41	24	794	10	1,608
Muskoka	Males	28	65	51	10	12	1	3	....	..	....	12	1	......	.....	183
	Females	42	60	42	8	13	....	1	....	..	....	13	5	......	.....	183
	Total	70	125	94	18	25	1	4	....	..	....	25	6	178	5	366

Counties	Sex	Under 20 years of age.	From 20 to 24 years.	From 25 to 29 years.	From 30 to 34 years.	From 35 to 39 years.	From 40 to 44 years.	From 45 to 49 years.	From 50 to 54 years.	From 55 to 59 years.	From 60 to 64 years.	From 65 to 69 years.	70 years and over.	Ages not given.
		Ages.												
Lanark	Males	5	63	93	46	34	12	3	6	1	1	..	3	7
	Females	25	111	65	32	12	8	3	4	....	1	.	1	12
	Total	30	174	158	78	46	20	6	10	1	2	..	4	19
...nville	Males	5	133	150	87	37	13	8	6	4	2	.	1	6
	Females	79	177	120	23	19	11	6	2	....	....	..	.	15
	Total	84	310	270	110	56	24	14	8	4	2	.	1	21
Lennox and Addington	Males	7	65	49	27	16	4	8	4	3	....	1	.	2
	Females	42	80	32	7	11	1	5	1	3	....	1	..	3
	Total	49	145	81	34	27	5	13	5	6	....	2	.	5
Lincoln	Males	2	80	77	34	15	7	7	4	....	3	1	1	1
	Females	48	93	41	22	10	6	2	2	....	....	.	1	7
	Total	50	173	118	56	25	13	9	6	....	3	1	2	8
Middlesex	Males	13	259	256	114	69	35	21	12	7	8	2	3	5
	Females	107	346	173	82	31	20	12	5	....	2	1	1	21
	Total	120	605	429	196	103	55	33	17	7	10	3	4	26
Muskoka	Males	1	61	71	18	16	6	2	1	....	2	2	1	2
	Females	51	74	31	15	2	......	....	1	1	1	2	..	2
	Total	52	135	105	33	18	6	2	2	1	3	4	1	4

Males	25	47	29	139	7	....	7	....	....	....	3	2	....	....	259	Nipissing	2	99	93	30	11	8	4	1	....	1	...	1	9
Females	24	34	31	147	8	2	6	....	....	....	2	5	....	....	259		86	110	31	11	3	2	....	....	....	....	1	..	15
Total	49	81	60	286	15	2	13	....	....	....	5	7	138	121	518		88	209	124	41	14	10	4	1	...	1	1	1	24
Males	21	21	80	11	60	1	3	....	....	....	5	8			213	Norfolk	7	82	60	25	12	7	6	4	3	4	2	1	...
Females	20	15	95	9	61	1	3	....	....	....	5	1	...		213		45	81	43	16	8	8	1	3	1	2	2	.	3
Total	41	36	175	20	121	2	6	....	....	....	10	9	207	6	426		52	163	103	41	20	15	7	7	4	6	4	1	3
Males	50	93	247	26	15	9	...	...	3	...	9	2	...		454	Northumberland and Durham	4	132	156	57	47	23	14	7	4	4	5	.	1
Females	54	70	265	24	18	5	....	....	1	...	9	8			451		62	171	116	49	24	11	6	4	4	....	1	.	6
Total	104	163	512	50	33	14	...	...	4	...	18	10	440	14	908		66	303	272	106	71	34	20	11	8	4	6		7
Males	27	61	141	29	24	....	....	....	1	...	7	....	....	....	290	Ontario	3	74	107	51	23	11	3	7	5	...	2	.	1
Females	25	63	144	25	22	....	....	....	....	...	7	4	....		290		10	106	83	30	13	9	3	2	...	1	1	.	2
Total	52	124	285	54	46	....	....	....	1	...	14	4	271	19	580		13	180	190	81	36	23	6	9	5	1	3		3
Males	41	72	153	9	46	9	8	2	1	7	8	6	...	....	362	Oxford	4	131	110	50	33	9	8	5	4	6	2	1	...
Females	41	70	146	9	62	3	8	5	1	7	7	3			362		11	172	71	29	20	13	3	...	4	...		1	2
Total	82	142	299	18	108	12	16	7	2	14	15	9	319	13	724		15	303	181	79	53	22	11	5	8	6	2	2	2
Males	16	38	59	20	9		1	1			6	1			155	Parry Sound	3	47	64	20	11	5	2	...	1	...			3
Females	25	34	54	18	10		7	1			3	1			156		52	66	18	10	4	1	...	...					5
Total	41	72	113	38	19		8	2		...	9	2	141	15	311		55	113	82	30	15	6	2	...	1	....			8
Males	21	38	78	12	10	...	...	...			2	1	...	...	165	Peel	1	22	59	52	20	5	....	2	2	1	...	.	1
Females	15	45	81	12	9	1	...	...		...	1	1			165		9	57	59	23	6	2	2	1	1	....	.	.	5
Total	36	83	159	24	19	1	...	...		...	3	2	153	10	330		10	79	118	75	26	7	2	3	3	1	...	.	6
Males	42	119	104	28	8	2	49	11	...	6	12	2			386	Perth	3	92	163	73	24	14	9	3	....	2			3
Females	40	110	93	30	10	4	54	22	.	8	6	7			386		29	185	103	40	15	7	1	1	....	..		.	5
Total	82	229	197	58	18	6	103	33		14	18	9	[illegible]	29	772		32	277	266	113	39	21	10	4	...	2			8
Males	54	53	140	60	20	3	...	...	.		4	3			337	Peterborough	1	115	111	56	25	11	6	5	2	1	3	1	3
Females	59	45	139	59	25	1	...		.		6	3			334		55	141	88	21	9	10	3	....	2	.	.	1	4
Total	113	98	279	119	45	4	...	....	.		10	6	289	18	671		56	256	199	77	34	21	9	5	4	1	3	2	7

MARRIAGES BY DENOMINATIONS AND AGES, 1904.—*Concluded.*

Counties	Sex.	Religious denomination of bride and bridegroom: Episcopalians.	Presbyterians.	Methodists.	Roman Catholic.	Baptists.	Congregationalists.	Lutherans.	Evangelical Association.	Quakers.	Mennonites.	Other denominations.	No denomination given.	How Married: License.	Banns.	Totals.
Prescott and Russell.	Males	11	37	10	288	7	....	......	....	..	....	2	3	......	......	358
	Females	13	29	11	292	6	....	......	....	.	....	4	3	......	......	358
	Total	24	66	21	580	13	...	......	....	.	....	6	6	102	256	716
Prince Edward	Males	20	6	87	7	....	....	......	....	1	....	3	....	......	......	121
	Females	19	8	86	5	......	1	......	....	.	....	3	2	......	......	121
	Total	39	14	173	12	......	1	......	....	1	....	6	2	120	1	248
Rainy River.	Males	28	37	10	20	4	1	9	....	.	....	2	...	......	...	111
	Females	26	32	11	25	5	1	10	....	.	....	1	....	......	......	111
	Total	54	69	21	45	9	2	19	....	.	....	3	...	92	19	222
Renfrew	Males	36	114	63	129	10	....	31	12	.	....	5	...	......	......	400
	Females	25	101	70	137	15	....	35	10	.	....	5	2	......	......	400
	Total	61	215	133	266	25	....	66	22	..	....	10	2	290	110	800
Simcoe	Males	127	178	220	84	23	2	1	....	1	10	11	....	......	......	660
	Females	135	162	216	87	20	10	......	....	1	8	16	5	......	......	660
	Total	262	340	436	171	43	12	1	....	2	18	30	5	590	70	1,320
Stormont, D. & Glengarry	Males	44	140	117	133	9	3	15	....	..	...	8	1	......	......	470
	Females	53	129	114	132	12	4	14	...	..	....	8	4	......	......	470
	Total	97	269	231	265	21	7	29	....	..	....	16	5	367	103	940

Counties	Sex.	Ages: Under 20 years of age.	From 20 to 24 years.	From 25 to 29 years.	From 30 to 34 years.	From 35 to 39 years.	From 40 to 44 years.	From 45 to 49 years.	From 50 to 54 years.	From 55 to 59 years.	From 60 to 64 years.	From 65 to 69 years.	70 years and over.	Ages not given.
Prescott and Russell.	Males	8	163	91	43	23	7	5	3	3	1	....	1	7
	Females	66	151	66	34	11	9	2	4	3	....	....	1	11
	Total	74	314	160	77	34	16	7	7	6	1	....	2	18
Prince Edward	Males	1	55	33	17	6	3	2	....	1	2	1	3	....
	Females	19	57	19	10	6	2	2	2	2	2	....	1	2
	Total	20	112	52	27	12	5	4	2	3	4	1	4	2
Rainy River.	Males	....	37	33	19	12	5	....	2	1	....	....	..	2
	Females	38	33	24	5	4	1	1	1	....	....	....	.	4
	Total	38	70	57	24	16	6	1	3	1	....	....	.	6
Renfrew	Males	1	129	159	62	17	14	9	4	1	2	....	..	2
	Females	82	194	86	17	8	5	3	1	...	1	....	..	3
	Total	83	323	245	79	25	19	12	5	1	3	....	..	5
Simcoe	Males	5	203	210	128	58	20	13	5	8	3	4	1	2
	Females	102	289	162	53	18	13	6	5	3	2	....		7
	Total	107	492	372	181	76	33	19	10	11	5	4	1	9
Stormont, D. & Glengarry	Males	14	165	†140	67	47	10	8	3	5	4	3	1	3
	Females	92	192	116	27	17	9	5	3	2	1	....	..	7
	Total	106	357	265	94	64	19	13	6	7	5	3	1	10

Males	30	38	27	52	3	....	41	....	..	....	3	4	....	....	198	Thunder Bay	5	75	64	37	11	3	2	1	....	....	....	....	....
Females	28	28	27	58	10	....	42	....	..	....	4	1	....	....	198		53	84	37	19	2	....	3	....	....	....	....		....
Total	58	66	54	110	13	....	83	....	..	....	7	5	151	47	396		58	159	101	56	13	3	5	1	....	..	.	.	....
Males	38	63	134	42	11	...		...	1	....	9	3	....	....	301	Victoria ..	4	83	106	56	20	17	2	2	...	4	...	3	4
Females	40	52	119	41	7	...		...			8	4	....	......	301		48	109	89	30	7	5	...	3	1	2	...		7
Total ...	78	115	283	83	18	.	.	...	1	.	17	7	273	28	602		52	192	195	86	27	22	2	5	1	6	....	3	11
Males	33	75	71	51	14	....	122	18	.	38	16	13	......	....	451	Waterloo .	5	162	157	62	27	13	7	6	6	2	.	2	2
Females	18	65	56	62	15	....	138	24	.	36	25	12	....	..	451		57	201	116	34	12	11	6	3	2	..	...	1	8
Total	51	140	127	113	29		260	42	.	74	41	25	358	93	902		62	363	273	96	39	24	13	9	8	2	..	3	10
Males	50	45	122	37	27	1	24	2	.	19	13	14	......	......	354	Welland	7	110	111	45	29	17	12	8	5	5	1	2	2
Females	56	45	116	45	25	..	17	5	1	11	21	9	......	......	354		70	137	64	31	20	12	10	4	2	1	.	.	5
Total ...	106	90	238	82	52	1	41	7	1	30	34	23	320	28	708		77	247	175	76	49	29	22	12	7	6	1	2	7
Males	30	123	144	43	32	6	11	1	.	2	17	3		.	412	Wellington .	2	113	141	75	48	13	10	3	...	2		2	1
Females	25	134	143	46	31	2	6	2		1	15	4	....		412		41	178	126	36	16	5	3	3	1	1	.		2
Total	55	257	287	89	66	8	17	3	.	3	32	7	383	29	824		43	291	267	111	64	18	13	6	1	3	.	2	3
Males	181	147	260	73	63	7	10	...	..	.	26	5			772	Wentworth	14	281	242	107	39	33	17	14	[illegible]	1	4	2	8
Females .	178	113	281	83	67	6	13	1	.		29	1		...	772		140	310	170	67	23	17	18	5	[illegible]		.	1	19
Total ..	359	260	541	156	130	13	23	1	...		55	6	751	18	1,544		154	591	412	174	62	50	35	19	10		4	3	27
Males	913	749	880	284	211	47	32	3	3	7	157	22		.	3,308	York	34	1,101	1,158	477	223	114	80	43	29	24	4	7	12
Females	915	676	905	315	218	53	30	....	4	6	146	40	....	......	3,308		116	1,467	823	298	127	61	39	17	11	6		2	41
Total	1,828	1,425	1,785	599	429	100	62	3	7	13	303	62	3,101	207	6,616		150	2,568	1,981	775	350	175	119	60	40	30	6	9	53
Males	3,267	4,269	6,350	2,896	1,247	189	549	104	19	96	571	232		...	19,789	Grand total .	270	6,466	6,487	3,033	1,515	755	435	257	154	131	81	61	144
Females	3,245	3,952	6,415	3,030	1,332	179	582	126	15	94	581	240	......	...	19,789		3,281	8,255	4,551	1,650	777	413	237	122	72	37	32	15	347
Total ...	6,512	8,221	12,765	5,926	2,579	368	1,131	230	34	190	1,152	472	17,787	1,992	39,578		3,551	14,721	11,038	4,683	2,292	1,168	672	379	226	168	113	76	491

CAUSES OF DEATHS BY COUNTIES IN 1904—ALGOMA (Including Municipalities of all Classes).

General Diseases.	Sex.			Nativity.			Social Condition.			Ages. Under 5.																			Months.												
	Male	Female	Not stated.	Canada.	Foreign	Not stated.	Single.	Married.	Not stated.	0-1	1	2	3	4	5-9.	10-14	15-19.	20-24	25-29.	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given.	January.	February	March	April	May.	June	July	August	September.	October.	November.	December	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	6			5	1		4	1	1									3		2				1						1		1			1		1	2			6
2. Smallpox																																									
3. Measles		1		1			1				1																					1									1
4. Scarlet Fever	2	1		3			3			1		1			1																	1				2					3
5. Whooping Cough	2			2			2			2																							1							1	2
6. Diphtheria and Croup	11	3		14			14			2	2	3	2	1	3				1										2		4	2			2	1	1	1		1	14
7. Influenza	5	5		10			8	2		3	1	1	1		1			2			1								2				1			1		1	2	3	10
8. Other Epidemic Diseases																																									
Total	26	10		35	1		32	3	1	8	4	5	3	1	5			5	1	2	1			1					4	1	4	5	2		3	1	2	4	2	5	36
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	1		2		1	2	1					1			1			1																		1	1	1		3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	29	32	1	47	7	8	32	25	5		1	1	1	7	2	2	9	10	6	4	4	2	1	2	3	5		2	6	7	6	3	2	5	5	9	6	6	2	5	62
4. Syphilis																																									
5. Cancer	4	1		2	1	2	1	4														1	1	2	1				1			2						1		1	5
6. Rheumatism and Gout	1	2		1	1	1	1	2															1		2								1	1		1					3
7. Diabetes																																									
8. Other General Diseases	3	1		3		1	3	1							1	1			1									1			2	1	1								4
9. Alcoholism, Acute and Chronic																																									
Total	36	40	1	55	9	13	39	33	5		1	1	2	7	3	4	9	10	8	4	4	3	3	4	6	5		3	7	7	8	6	4	6	5	10	7	8	3	6	77
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	3	3		4		2	3	2	1	2					1				2	1									1		1		1	1			2				6
2. Simple Meningitis	4	1		5			4		1	3	1					1																3			1				1		5
3. Epidemic Cerebro-spinal Meningitis	2			2			2			2																			1						1						2
4. Congestion and Hemorrhage of the Brain		2				2		2													2												1			1					2
5. Softening of the Brain																																									
6. Paralysis without specified cause	1	4		3	2			4	1													1			2	1		1		1	1			2					1		5
7. Insanity																																									
8. Epilepsy	2			1		1		1	1										1	1										1	1										2
9. Convulsions (not puerperal)	1			1			1						1																											1	1
10. Other Nervous Diseases	1				1			1																1										1							1
Total	14	10		16	3	5	10	10	4	7	1		1		1	1			2	2	3	1		1	2	1		1	2	2	3	3	2	1	2	1	2		2	1	21

ALGOMA.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis	2	1		1	2		2	1								1				1		1								1					1	1					3
2. Endocarditis																																									
3. Organic Heart Diseases	10	5		6	7	2	3	12									1	1	1		1	1		2	1	3	1		2		2	1	5	1	1		1	1	2	1	15
4. Angina Pectoris	1				1			1																	1										1						1
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of the Circulatory System	8	12		14	3	5	7	12	1	2					1			2	3	1		2	1	3	2	2	1		2		4	1	2	1	2	1	2	2	1	2	20
Total	21	18		21	13	7	12	26	1	2					1	1	1	3	4	2	1	4	1	5	7	5	2		4	1	6	2	5	2	5	2	3	3	3	3	39
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	1	1					2			1					1														1								1				2
2. Chronic Bronchitis	1				1			1																	1							1									1
3. Broncho-pneumonia		1		1			1				1																					1									1
4. Pneumonia	16	6		17	5	2	13	4	5	8	2		1				1	2				3	1	1	1	1	1		1	5		3	5	2		2	1		1	2	22
5. Pleurisy	3	1		3	1			2	2										1			1		1	1					1					1		1		1		4
6. Congestion of the Lungs, inc. pul. apoplexy	5	6		9	2		10	1					1	2	1	1	5					1										3		3		1		1	1	2	11
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System	4	3		5	2		5	1	1	2		1			2											1									1	1	1	2		2	7
Total	30	18		35	11	2	31	9	8	11	3	1	2	2	4	1	6	3	1			5	1	2	3	2	1		2	6		8	5	5	2	4	4	3	3	6	48
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	3	3		1	1	1	3	3		2									1				1	1	1				1	1	1	1	1								6
3. Infantile Diarrhœa and Cholera Infantum	14	7		19	1	1	21			20	1																				2		1			11	3	3	1		21
4. Diarrhœa and Enteritis (not infantile)	2	1		3			3						1		2															2							1				3
5. Dysentery	1	1		2			2			1			1																							1	1				2
6. Hernia and Intestinal obstructions	1			1				1																		1			1												1
7. Other Diseases of the Intestines	4	4		5	3		5	3		3	1				1										1	1		1		1	2	2		1				1	1		8
8. Diseases of the Liver	1	1		1		1	2				1					1														2											2
9. Peritonitis (not puerperal)	3	3		1	4	1	1	3	2	1								2				2		1						1							1	2		2	6
10. Iliac Abscess and Appendicitis	2	2		3		1	3		1							1	2							1						1	1						1			1	4
Total	31	22		39	9	5	40	10	5	27	3		2		3	2	2	2	1			2	1	3	2	2			2	8	7	3	2	1		12	7	6	2	3	53
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	1				1		1																			1												1			1
2. Bright's Disease	1	2		3		3		6																	3	1	1	1		1	1		2	2							6
3. Other Diseases of Kidneys and Adnexa	2	5		6		1	1	6					1					1		1	2	1	1						1		1			2	1				1	1	7
4. Vesical Calculi																																									
5. Diseases of the Bladder	2				1	1	1	1														1					1						1						1		2
6. Diseases of the Male Genital Organs	1				1			1																	1					1											1
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		1				1		1																				1											1		1
10. Other Diseases of the Female Genital Organs																																									
Total	10	8		9	3	6	3	15					1					1		1	2	2	1		4	2	2	2	1	2	2		3	4	1			1	3	1	18

	Figures by column (as far as legible)	Total
VIII. PUERPERAL DISEASES.		
1 Puerperal Septicaemia	5 … 1 … 1 5 … 1 2 1 1 1 1 1 1	5
2 Puerperal Albuminuria and Convulsions	4 2 … 6 … 5 1 … 1 1 1 1 1 1	6
3 Other accidents of Pregnancy sudden death	12 … 10 1 1 2 16 … 2 2 1 3 4 1 1 1 1 2 1 2 2 1	12
4 Puerperal Disease of the Breast	…	
Total	4 19 20 1 2 8 5 … 5 1 2 3 5 4 3 3 3 1 3 2 1	[illegible]
IX. THE SKIN.		
1 Erysipelas	…	
2 Skin and Adnexa (cancer excepted)	…	
X. LOCOMOTOR SYSTEM. Total	…	
1 Pott's Disease	…	
2 Diseases of Bones and Joints	…	
3 Amputation (for unspecified Disease)	…	
XI. MALFORMATIONS, ETC. Total	…	
1 Still Births	16 9 … 25 25 … 25 … 3 2 2 1 2 6 6 2 1 3	28
2 Congenital Debility and Malformations	47 37 … 81 … 81 … 82 … 9 5 7 7 13 4 4 10 3 1 4 6	81
3 Other Diseases of Infancy	6 6 12 12 8 1 2 1 2 1 1 1 3	12
4 Senile Decay	18 15 … 14 12 4 25 2 16 4 3 4 4 1 5 2 3 1 3 1 1 2 5	33
Total	8 67 6 158 12 7 128 25 2 118 1 16 4 6 7 3 11 6 16 6 4 16 7 17 7 7	157
XII. SUICIDE.		
1 Poison	…	
2 Strangulation	…	
3 Gas Poisoning	…	
4 Drowning	…	
5 Firearm	…	
Total	…	
XIII. ACCIDENT.		
1 Fractures and Dislocations	…	
2 Gunshot	2 1 2 1 1 1	3
3 Lightning	1 1 1	1
4 Drowning	10 4 6 5 4 1 2 2 1 1 1 2 2 4 1	10
5 Electric Car	…	
6 Bicycle	…	
7 Railways	4 2 1 1 2 2 1 1 1 1	4
8 Burns and Scalds	…	
9 Homicide	…	
10 Other Accidents	25 4 10 6 10 13 9 1 3 4 5 5 2 2 1 2 1 1 1 1 2 8	25
Total	39 4 … 19 7 17 18 16 9 … 1 1 1 2 7 10 4 4 1 6 2 1 2 1 2 1 1 4 6 1 2 1	43
XIV. ILL-DEFINED CAUSES.		
1 Dropsy	2 4 1 1 1 2 4 1 1 2 1 1 2 2	6
2 Tumours	1 1 1 1 1	1
3 Other Ill-defined Causes	1 12 11 2 5 2 7 7 1 1 1 1 1 1 2 5 4 1 2 2 1 1 2 2 1 1 1 1 1	16
Total	6 17 15 3 5 4 12 7 1 1 1 1 1 3 3 3 6 2 1 2 2 3 1 3 1 1 1 3 1	23
Total from all Causes	304 233 4 402 72 67 325 176 40 178 20 5 12 10 18 10 22 35 30 20 24 4 17 18 30 6 20 12 43 45 47 44 24 34 46 66 41 47 35 49	541

CAUSES OF DEATHS BY COUNTIES IN 1904. BRANT. (Including Municipalities of all Classes).

General Diseases	Sex			Nativity.			Soc. Con.			Ages. Under 5																			Months												
	Male.	Female	Not stated	Canada.	Foreign	Not stated.	Single.	Married	Not stated.	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	8	3	...	8	1	2	4	4	3								2	4	1	1	1	1						1	2	2						3	1	1	2		11
2. Smallpox																																									.....
3. Measles																																									.....
4. Scarlet Fever	...	1	...	1			1								1														1												1
5. Whooping Cough																																									.....
6. Diphtheria and Croup	5	2	...	6	1		3	...	4					1	3	1												2	1	2	3		1								7
7. Influenza	3	2	...	2	2	1		5																1	1	1	2		1	1	3										5
8. Other Epidemic Diseases																																									.....
Total	16	8	...	17	4	3	8	9	7					1	4	1	2	4	1	1	1	1		1	1	1	2	3	5	5	6		1			3	1	1	2		24
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	4	...	4	1	1	1	4	1									1	1	1		2						1		1		2		1				1	1		6
2. Malarial Fever																																									.....
3. Tuberculosis and Scrofula	20	19	..	34	5	.	15	18	6	3			1				1	6	4	3	3	4	3	6	1	3		1	2	3	4	8	2	3	6	1	4		2	4	39
4. Syphilis																																									.....
5. Cancer	8	11	...	11	7	1	3	13	3												1	2	2	2	5	5	2			2	1	1	3	1	2	2	3		1	3	19
6. Rheumatism and Gout																																									.....
7. Diabetes																																									.....
8. Other General Diseases	...	3	..	3	...	...	1	2											1					1	1								1		1					1	3
9. Alcoholism, Acute and Chronic																																									.....
Total	30	37	....	52	13	2	20	37	10	3			1				1	7	6	4	4	8	5	9	7	8	2	2	2	6	5	11	6	5	9	3	7	1	4	8	67
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1	....	...	...	1	..	...	1															1							1											1
2. Simple Meningitis	5	6	..	9	2	..	8	1	2	4	2						1		1	1		1			1				2	1		2	2	1		1	2				11
3. Epidemic Cerebro-spinal Meningitis	...	2	....	2	....	....	2			2																						1				1					2
4. Congestion and Hemorrhage of the Brain	5	14	...	10	7	2	5	13	1	...		1					1		1					4	3	6	3		1			2	2	3	1	3	1	3	2	1	19
5. Softening of the Brain	2	....	....	2	...	...	...	2	....																	2					1		1								2
6. Paralysis without specified cause	8	11	....	9	6	4	1	15	3	....										1				3	3	9	2	1	1	3	3	3	1	3		1		2	2		19
7. Insanity	2	2	....	4	....	..	2	2	....									1		1	1			1					2			1		1							4
8. Epilepsy																																									.....
9. Convulsions (not puerperal)	4	5	...	9	....	...	9	...	....	8	1																				4	1	1		1				2		9
10. Other Nervous Diseases	2	1	....	....	2	1	....	3	....															2		1			1							2					3
Total	29	41	....	45	18	7	27	37	6	14	3	1					2	1	2	3	1	1	1	10	7	18	5	1	7	5	8	10	7	8	2	8	3	5	6	1	70

IV. DISEASES OF CIRCULATORY SYSTEM.														
1. Pericarditis														
2. Endocarditis		1			1				1				1 1	1
3. Organic Heart Diseases	13	15		13	15		6	20	2				1 2 2 1 2 4 3 7 6 1 2 2 3 1 2 3 2 1 4 4	28
4. Angina Pectoris	1	2		1	2			3					2 1 1 1 1	3
5. Arteries, Atheroma, Aneurism, etc	2				2			2					1 1 1 1	2
6. Other Diseases of Circulatory System	16	7		11	9	3	6	12	5				1 1 1 1 1 4 9 1 1 2 1 4 3 1 1 2 2 5 2	23
Total	32	25		25	29	3	12	37	8				1 3 1 3 1 1 3 9 12 11 12 6 3 6 1 1 3 3 5 4 7 1 8	57
V. RESPIRATORY SYSTEM.														
1. Acute Bronchitis	2	5		5	2		4	2	1	3			1 2 1 1 1 1 2 1 1	7
2. Chronic Bronchitis		2		2				1	1				1 1 1 1	2
3. Broncho-pneumonia	1	2		3				2	1		1		1 1 1 1 1	3
4. Pneumonia	19	15		16	16	2	5	22	7	2		1	1 1 2 1 1 1 2 1 2 11 4 1 8 8 1 1 2 2 1 1 1 1 1 1	31
5. Pleurisy														
6. Congestion of the Lungs, inc. pul. apop.	1	1		2				2					2	
7. Asthma and Emphysema													1 1	2
8. Other Diseases of Respiratory System	1	2		1	2			3					1 1 1 2 1	3
Total	21	27		29	20	2	9	32	10	5	1	1	1 1 2 1 1 1 5 7 7 5 6 1 10 11 8 1 4 2 1 1 3 3 2 5	51
VI. DIGESTIVE SYSTEM.														
1. Ulcer of the Stomach														
2. Other Diseases of Stomach (cancer excepted)	2	3		3		2	2	2	1	1			1 1 1 1 1 1 1 2	5
3. Infan. Diarrhoea and Cholera Infantum	7	3		10			10			10			2 5 2 1	10
4. Diarrhoea and Enteritis (not infantile)	1			1				1					1 1 1	1
5. Dysentery	1			1				1					1 1	1
6. Hernia and Intestinal obstructions	4	2		3	2	1		1	2				2 2 1 1 1 1 1 1	6
7. Other Diseases of the Intestines	3	1		1			1		3	2	1		1 1 1 2 1	4
8. Diseases of the Liver	3			3			1	2					1 1 1 1 2 1 1	3
9. Peritonitis (not Puerperal)	1	4		3	1	1	1	4		1			1 1 1 1 1 1 1 1 1	5
10. Iliac Abscess and Appendicitis		1		1			1						1 1	1
Total	22	11		29	3	1	16	14	6	14	1		2 1 2 2 1 5 1 2 1 3 1 1 1 2 3 5 6 1 6	36
VII. GENITO-URINARY SYSTEM.														
1. Acute Nephritis	1	2		1	2		1	1	1				1 2 1 1 1	3
2. Bright's Disease	3	1		3		1	1	2	1				2 1 1 1 1 1 1	4
3. Other Diseases of Kidneys and Adnexa	2	2		4			1	2	1				1 1 1 1 1 1 1 1	4
4. Vesical Calculi														
5. Diseases of the Bladder	2	3			4	1		4	1				1 3 1 1 2 1 1	5
6. Diseases of the Male Genital Organs	1			1				1					1 1	1
7. Metritis														
8. Other Diseases of the Uterus														
9. Ovarian Cysts and other Ovarian Tumors														
10. Other Diseases of Female Genital Organs		2		1	1		1	1					1 1 1 1	2
Total	9	10		10	7	2	4	11	4				1 1 1 1 2 2 5 7 1 2 2 1 2 3 2 1 1 3 2	19
VIII. PUERPERAL DISEASES.														
1. Puerperal Septicaemia		2		2				2					1 1 1 1	2
2. Puerperal Albuminuria and Convulsions		1		1				1					1 1	1
3. Other acc. of Preg., sudden death														
4. Puerperal Disease of the Breast														
Total		3		3				3					2 1 1 1 1	3

BRANT.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IX. THE SKIN																				
1. Erysipelas	1			1					1											
2. Skin and Adnexa (cancer excepted)																				
Total	1			1					1											
X. LOCOMOTOR SYSTEM																				
1. Pott's Disease																				
2. Diseases of the Bones and Joints	1																			
3. Amputation (for unspecified diseases)																				
Total	1			1				1												
XI. MALFORMATIONS, ETC.																				
1. Still-births	25	15	5	49			43			43										
2. Congen. Debility and Malformations	19	16		35			35			35										
3. Other Diseases of Infancy	1			1			1			1										
4. Senile Decay	26	40		21	47	1	15	47	7											
Total	71	71	5	106	47	1	94	[illegible]	7	79										
XII. SUICIDE																				
1. Poison																				
2. Strangulation																				
3. Gas Poisoning																				
4. Drowning	1				1		1													
5. Firearms																				
Total	1				1		1													
XIII. ACCIDENTS																				
1. Fractures and Dislocations	1				1			1												
2. Gunshot	1				1		1													
3. Lightning		1			1			1												
4. Drowning	2			1	1															
5. Electric Cars																				
6. Bicycles																				
7. Railways	1			3	1			2	2											
8. Burns and Scalds	2	1		3			2		1											
9. Other Accidents	11			11			1	6	1	1										
Total	21	2		18	5		7	10	6	1										
XIV. ILL DEFINED CAUSES																				
1. Dropsy	1	2		2	1		1	2												
2. Tumors	1	3		3	1		2													
3. Other Ill defined Causes	1	1		1	3	1	1	3	1											
Total	6	6		6	5	1	1	7	1											
Total from all causes	266	244	3	336	152	25	202	245	66	116	6	2	1	1	7	5	12	15	19	18

Number of Column	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
1. Erysipelas																					1
2. Skin and Adnexa (cancer excepted)																					
Total																					1
1. Pott's Disease																					
2. Diseases of the Bones and Joints																					1
3. Amputation (for unspecified diseases)																					
Total																					1
1. Still-births																					43
2. Congen. Debility and Malformations																					35
3. Other Diseases of Infancy																					1
4. Senile Decay																					69
Total																					148
1. Poison																					
2. Strangulation																					
3. Gas Poisoning																					
4. Drowning																					1
5. Firearms																					
Total																					1
1. Fractures and Dislocations																					1
2. Gunshot																					1
3. Lightning																					1
4. Drowning																					2
5. Electric Cars																					
6. Bicycles																					
7. Railways																					1
8. Burns and Scalds																					3
9. Other Accidents																					11
Total																					23
1. Dropsy																					3
2. Tumors																					1
3. Other Ill defined Causes																					5
Total																					12
Total from all causes	11	18	13	48	43	103	65	10	54	51	49	40	49	43	32	40	35	39	34	47	513

CAUSES OF DEATHS BY COUNTIES IN 1904.—BRUCE.—(Including Municipalities of all classes.)

General Diseases.	Sex: Male	Sex: Female	Sex: Not stated	Nativity: Canada	Nativity: Foreign	Nativity: Not stated	Social con.: Single	Social con.: Married	Social con.: Not stated	Ages: Under 5: 0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months: January	February	March	April	May	June	July	August	September	October	November	December	Total
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	7	3		8	2		5	4	1		1							2	2		1		1	1		2						1	1		5		3		1	1	10
2. Smallpox																																									
3. Measles		1		1			1				1																				1										1
4. Scarlet Fever	2	2		4			4				1		3																1				2						1		4
5. Whooping Cough																																									
6. Diphtheria and Croup	5	10		15			15					1		2	6	2	1	1		1	1								3	4		2		3					2	1	15
7. Influenza	5	3		4	3	1	1	4		1				1				1				1		1		1	2		1	2	1		1		1	1				1	8
8. Other Epidemic Diseases																																									
Total	19	19		32	5	1	29	8	1	1	5	1	3	3	6	2	1	1	2	1	2	1	1	2		3	2		5	6	2	5	1	3	1	1	3		4	3	38
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	5	6		7	4		2	8	1									1	1	1		1			3	1			1		1	1	1				1				11
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	37	38		61	17		26	49			1					2	5	8	10	9	6	1	11	11	1	1			2	4	10	6	10	7	10	4	10	5	4	3	75
4. Syphilis																																									
5. Cancer	15	13		16	12		6	22														1		8	8	6	2		5	2	1	3	1	3	3	1	4	1	2	2	28
6. Rheumatism and Gout	4	2		2	1		2	1									1			1				1	2	1			2	1		1	1					1			6
7. Diabetes																																									
8. Other General Diseases	5	6		8	3		2	9										1	2		1		1	2	2	2					1	1		5		2	1	1			11
9. Alcoholism, Acute and Chronic																																									
Total	66	65		97	34		38	92	1		1					2	6	10	16	11	7	6	15	2	19	11	2		13	7	13	12	16	15	13	7	16	8	6		131
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	10	6		15		1	13	2	1	8			1				1	1			1		1						1	3		1	1		2	1		1			16
3. Epidemic Cerebro-spinal Meningitis	2	2		3	1		3	1						1	1	1				1													1			1	1		1		4
4. Congestion and Hemorrhage of the Brain	13	10		8	15		1	20	2											1			1	4	4	9	1		1	3	2	3		3	1	2			1	1	23
5. Softening of the Brain																																									
6. Paralysis without specified cause	10	18		11	17		3	23	2														1	3	8	13	3		1	2	2	1	5		1	1	2	3		1	28
7. Insanity																																									
8. Epilepsy	1			1					1									1																		1					1
9. Convulsions (not puerperal)	12	9		21			20		1	17	1	1							2										2		1	2			1	1	3	2	2	2	21
10. Other Nervous Diseases	7	1		8	3		3	8		1					1			2	1				2	2		1	1		1	2					1		2		2	1	11
Total	55	49		67	36	1	43	51	7	26	1	1	1	1	2	1	1	7	3	2	1		5	9	12	23	8		6	15	5	7	12	3	9	10	8	9	9	11	104

BRUCE.—*Continued.*

Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. DISEASES OF CIRCULATORY SYSTEM.																																									
1. Pericarditis	2			2			2								2															1							1				2
2. Endocarditis	3			3			2	1		1							1								1					1		1								1	3
3. Organic Heart Disease	20	22		16	21	2	5	37								1					1	1	2	2	17	9	9		5	1	1	6	1		1	2	7	3	5	4	42
4. Angina Pectoris	1			1				1																1					1												1
5. Diseases of Arteries, Atheroma, Aneurism, etc	5			1	1		1	3	1														1			2	2		2			1					2				5
6. Other Diseases of the Circulatory System	13	13		14	12		10	15	1	2					1	3		1					1	1	3	6	5		3	1	3	2	5	3	1	1		2		2	26
Total	44	35		37	40	2	20	57	2	3					3	4	1	1			1	1	4	7	21	17	16		11	7	4	10	6	3	5	6	10	5	5	7	79
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	8	6		12	2		10	1		6	1										1				1	1	1		2	3	1	3			1	1	1			2	14
2. Chronic Bronchitis		2			2			2																	1	1			1											1	2
3. Broncho-pneumonia	1	4		5			2	3		3												1				1			1				1	1				1	1		5
4. Pneumonia	17	9		14	10		15	9	2	6		3						3		1	1			2	2	7	1			4	5	4	1	2		2	2	4		2	26
5. Pleurisy	1			1				1																		1											1				1
6. Congestion of the Lungs inc. pul. apoplexy	2	2		4			4			2	1					1													1		1			1					1		4
7. Asthma and Emphysema		3		2	1		1	2													1				2					1							1		1		3
8. Other Diseases of Respiratory System	2			1	1		1	1		1														1						1										1	2
Total	31	26		41	16		33	22	2	18	5	3				1		3		1	3	1		3	6	11	2		5	9	7	7	2	4	1	3	5	5	3	6	57
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	4	4		4	4		4	4		2										1			1	1		2	1		1		1	2		1				2		1	8
3. Infan. Diarrhœa and Cholera Infantum	1	5		9			9			7	2																		1	2	1			1	1		1	2			9
4. Diarrhœa and Enteritis (not infantile)		2			2			2																		2						1				1					2
5. Dysentery		2			2		1	1														1				1										1			1		2
6. Hernia and Intestinal obstructions	3	6		6	3		1	7	1	1															1	2	2			3	1		1				2	1	1		9
7. Other Diseases of the Intestines	6	3		7	2		5	4						1	1		2			1	1				1	1	1				1		2		2	5	1				9
8. Diseases of the Liver	1	1		1	1			2																		2										1			1		2
9. Peritonitis (not puerperal)	4	5		6	3		2	7								1		1			1			1	2	3			3			1	1				3	1			9
10. Iliac Abscess and Appendicitis	3	2		4	1		4	1					1		1		1		1							1						2		1	1				1		5
Total	25	30		37	18		26	28	1	10	2		1	1	2	1	3	1	1	2	2	1	1	2	7	14	4		5	5	4	6	1	3	4	6	7	6	4	1	55
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis		3		3				2	1											1			1	1											1		1		1		3
2. Bright's Disease	7	5		7	5		2	9	1									1	2				1		1	4					2		1	2		1		4	2		12
3. Other Diseases of the Kidneys and Adnexa	6	6		11	1		2	10								1					1			3	1	4	2		1	2		1		2	1	2	1		1	1	12
4. Vesical Calculi	2				2			2																		2														2	2
5. Diseases of the Bladder	5				5			4	1																	4	1					1		2			2				5
6. Diseases of the Male Genital Organs	2			1	1			1	1																1	1							1						1		2
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs		1			1			1														1																1			1
Total	22	15		22	15		4	29	4							1		1	2	1	1	1	5	1	3	15	3		1	2	2	2	2	6	2	3	1	5	5	3	37
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		1		1			1											1														1									1
2. Puerperal Albuminuria and Convulsions		2		1	1			2											2											1	1										2
3. Other accidents of Pregnancy, sudden death																																									
4. Puerperal Diseases of the Breast																																									
Total		3		2	1		1	2										1	2											1	1	1									3

IX. OTHER DISEASES OF THE SKIN.																																								
1. Erysipelas	2	1		1	2		1	2		1																	2		1					1		1				3
2. Other dis. of Skin & Adnexa (cancer excepted)		1		1				1														1											1							1
Total	2	2		2	2		1	3		1												1					2		1				1	1		1				4
X. LOCOMOTOR SYSTEM.																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation (for unspecified Diseases)																																								
Total																																								
XI. MALFORMATIONS, ETC.																																								
1. Still-Births	23	15		38			38			38																		3	4	5	2	2	7	2	5	2	3		3	38
2. Congenital Debility and Malformations	11	11		25			25			25																		1	1	2	3	3	1	3	2	2	2	1	4	25
3. Other Diseases of Infancy	5	2		7			7			5	1		1															1	1	1			2	2						7
4. Senile Decay	56	43		11	83	2	10	81	5																2	27	70	7	12	9	9	8	1	10	5	4	10	8	13	99
Total	98	71		84	83	2	80	81	5	68	1		1												2	27	70	12	18	17	11	13	11	17	12	8	15	9	20	169
XII. SUICIDE.																																								
1. Poison																																								
2. Strangulation		1		1			1																1								1									1
3. Gas Poisoning																																								
4. Drowning																																								
5. Firearms																																								
Total		1		1			1																1								1									1
XIII. ACCIDENTS.																																								
1. Fractures and Dislocations																																								
2. Gunshot		1		1				1															1									1								1
3. Lightning																																								
4. Drowning	6			4	1	1	3	2	1						1		2			1		1		1								2		3	1					6
5. Electric Cars																																								
6. Bicycles																																								
7. Railways	3	2		2	3			5																	2	1	2				1	2						2		5
8. Burns and Scalds																																								
9. Homicide																																								
10. Other Accidents	6			3	3		2	1				1						1							1	2	1	1			2			2					1	6
Total	15	3		10	7	1	5	12	1			1			1		2	1		1		1	1	1	3	3	3	1			3	5		5	1			2	1	18
XIV. ILL DEFINED CAUSES.																																								
1. Dropsy	1	9		6	4		3	7										1	2					1	3	3			1	4	3		1					1		10
2. Tumors	1	5		5	1		3	3							1			1	1				2		1			1			1	1	1			1		1		6
3. Other Ill-Defined Causes	19	4		18	1	1	11	8	1	6	3	1		1				1		1		3			4	1	2	3	1	3	2		2		5	3	3	1		23
Total	21	18		29	9	1	20	18	1	6	3	1		1	1			3	3	1		3	2	1	8	1	2	4	2	7	6	1	4		5	4	3	3		39
Total from all Causes	398	337		461	266	8	301	409	25	133	16	7	6	6	15	12	14	32	29	20	17	16	35	51	81	131	114	63	73	62	72	65	56	61	54	66	56	50	57	735

CAUSES OF DEATHS BY COUNTIES IN 1904.—CARLETON.—(Including municipalities of all classes.)

General Diseases.	Sex: Male	Female	Not stated	Nativity: Canada	Foreign	Not stated	Social Conditions: Single	Married	Not stated	Ages: Under 5: 0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months: January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	13	5	...	16	2	...	10	7	1			1			1	2	1	3	2	5			2			1			1			1				2	3	4	2	4	18
2. Smallpox	...	...	...	...	...	...	...	...	...	...																															...
3. Measles	4	1	...	5	...	...	5	...	...	2	1	2																								1	1		1	2	5
4. Scarlet Fever	1	4	...	5	...	...	...	...	...	1				2	2														1						1			1	1	1	5
5. Whooping Cough	4	5	...	9	...	...	9	...	...	3	1	1	1																2	2		1			2		2				9
6. Diphtheria and Croup	3	1	...	4		...	1	...	...	...		2	1	1															1	1			1					1			4
7. Influenza	3	5	...	6	2		2	5	1	1										1	1			1	2	1	1	...		5	1	1	1								8
8. Other Epidemic Diseases	...	...	...	...		...	...	...																																	
Total	25	21	...	45	4	...	35	12	2	7	5	6	2	3		2	1	2	2	6	1		2	1	2	2	1			8	1	5			6	5	7	6	4	7	49
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and septicaemia	9	2		6	1	4	3	6	2	...								1	2	2	2		1		1				2	1		1	2		1	2		2			11
2. Malarial Fever	...	...	...	...	...	...	...	...	...	...																															...
3. Tuberculosis and Scrofula	72	82	...	131	18	5	76	56	22	1	5	2	1	1	1	5	29	30	15	14	18	6	3	1	2	2	1		6	5	18	6	1	15	8	15	9	16	11	9	154
4. Syphilis	3		...	3	...		3	...	...	2				1															1											2	3
5. Cancer	19	31	1	31	19	1	3	41	7	...										1	1	2	5	10	16	9	5	1	1	7	3		2	6	3	6	5	1	1	5	51
6. Rheumatism and Gout	1	5	...	5	1	...	3	2	1	...							1		1	1			2	1								3	1							2	6
7. Diabetes	1	2	...	3	...		2	...	1	...									1			1		1					1	1			1								3
8. Other General Diseases	9	10	...	17	2	...	9	9	1	7	1	...						1	1	1	3		1	2	1	1			2	1	4	1	5	3		2		1	1	1	19
9. Alcoholism, Acute and Chronic	1	2	...	2		1	1	1	1	...										1	1			1					1								1	1			3
Total	115	134	1	198	44	8	100	115	35	10	4	2	1	2	4	5	30	32	30	20	27	13	12	8	30	14	5	1	19	5	5	4	22	24	12	25	1	21	16	19	250
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2	...	...	2	...	...	1	...	1	1																		1							2						2
2. Simple Meningitis	12	13	...	23	2	...	22	3	...	7	3	6		2	2						1	1	1	1				1	1		1		2	2	2	2	2	1	2	2	25
3. Epidemic Cerebro spinal Meningitis	1	3	...	4	...	...	3	1	...	1	1							1	1										1	1			1						1		4
4. Congestion and Hemorrhage of the Brain	20	21	1	25	19	1	4	30	11	...	1	1							1				3	4	13	11	7	1	5	6	3	6	5	3	9	2	2	2	2		45
5. Softening of the Brain	1	1	...	2	...	...		2	...	...														1	1	1												1			2
6. Paralysis without specified cause	21	20	...	29	12	...	4	29	8	...									1	1		2	1	6	12	5	13		3	5	2	2	6	2	1	3	3	3	1	10	41
7. Insanity	...	2	...	1	1		...	1	1	...												1					1		1			1									2
8. Epilepsy	...	3	...	...	2	1	3	...	...	...					1									1		1					1			1			1				3
9. Convulsions (not puerperal)	23	22	...	45	...	...	11	1	...	32	11				1						1								4	4	3		7	2	5	2	2	7	3	3	45
10. Other Nervous Diseases	...	1	...	1	...	...	4	...	...	1														2	...	1			1				2	...			...		1		4
Total	80	92	1	135	36	2	85	67	21	42	16	7	...	2	4	...		1	3	1	2	4	5	14	26	22	21	3	16	19	11	14	23	10	19	9	10	17	10	15	173

IV. CIRCULATORY SYSTEM.												
1. Pericarditis	1	...	...	...	1	...	...	1	...	...	[illegible]	1
2. Endocarditis	7	6	...	11	2	...	6	1	3	...	[illegible]	13
3. Organic Heart Diseases	32	15	...	52	23	2	17	50	10	2	[illegible]	77
4. Angina Pectoris	1	1	...	1	1	...	...	2	...	...	[illegible]	2
5. Arteries, Atheroma, Aneurism, etc.	3	8	...	1	7	...	2	8	1	1	[illegible]	11
6. Other Diseases of Circulatory System	33	18	...	37	14	...	26	22	3	3	[illegible]	51
Total	77	78	...	105	48	2	51	87	17	6	[illegible]	155
V. RESPIRATORY SYSTEM.												
1. Acute Bronchitis	17	13		26	4	...	20	9	1	15	[illegible]	30
2. Chronic Bronchitis	12	1	...	8	4	1	1	16	2	...	[illegible]	13
3. Broncho-pneumonia	19	17	...	30	4	2	27	6	3	13	[illegible]	36
4. Pneumonia	52	39	...	68	23	...	16	34	14	12	[illegible]	91
5. Pleurisy	7	4	...	8	3	...	4	4	3	...	[illegible]	11
6. Congestion of the Lungs (inc. pul. apoplexy)	5	4	.	5	3	1	4	4	1	2	[illegible]	9
7. Asthma and Emphysema	2	4	...	5	1	...	1	3	2	...	[illegible]	6
8. Other Diseases of Respiratory System	2	1	.	3	..	..	2	...	1	1	[illegible]	3
Total	116	83	.	133	42	4	105	70	24	43	[illegible]	139
VI. DIGESTIVE SYSTEM.												
1. Ulcer of the Stomach	...	...	...	...	...	...	...	...	...	...	[illegible]	...
2. Other Diseases of Stomach (cancer excepted)	11	7	.	14	2	2	11	6	1	6	[illegible]	18
3. Infant. Diarr. and Gastro-Ent. (cholera infant.)	59	48	2	[illegible]	...	...	109	...	...	99	[illegible]	109
4. Diarrhœa and Enteritis (not infantile)	2	3	.	3	2	...	2	2	1	.	[illegible]	5
5. Dysentery	...	...	...	...	...	...	...	...	...	...	[illegible]	..
6. Hernia and Intestinal obstructions	6	3	...	6	2	1	1	6	2	.	[illegible]	9
7. Other Diseases of the Intestines	7	7	..	12	2	.	11	3		6	[illegible]	14
8. Diseases of the Liver	10	5	.	9	4	...	7	6	...	1	[illegible]	15
9. Peritonitis (not puerperal)	14	13		26	1	...	13	11		.	[illegible]	24
10. Iliac Abscess, Typhlitis, Perityphlitis, Appendi.	10	5	...	11	1	...	11	4	...	.	[illegible]	15
Total	116	89	2	190	14	3	165	38	1	112	[illegible]	207
VII. GENITO-URINARY SYSTEM.												
1. Acute Nephritis	8	4		9	3		6	5	.	2	[illegible]	12
2. Bright's Disease	13	4	.	11	6	..	4	11	2	...	[illegible]	17
3. Other Diseases of the Kidneys and Adnexa	4	3		6	1	.	2	4	1	...	[illegible]	7
4. Vesical Calculi	...	...		...	...	...	...	...	...	...	[illegible]	..
5. Diseases of the Bladder	4	1	.	5	...	...	1	4			[illegible]	5
6. Diseases of the Male Genital Organs	3	.	..	3	.	..	...	3	...	...	[illegible]	3
7. Metritis	...			...	...	...	...	...	.	...	[illegible]	
8. Other Diseases of the Uterus	...	...	...	...	...				...		[illegible]	
9. Ovarian Cysts and other Ovarian Tumors	...	...	...	...		...	...	...	...	.	[illegible]	
10. Other Diseases of Female Genital Organs	.	2	.	1	1		...	1	1	...	[illegible]	2
Total	32	14	...	35	11	...	13	28	5	2	[illegible]	46
VIII. PUERPERAL DISEASES.												
1. Puerperal Septicaemia	...	5	...	1	1	1	..	2	1	...	[illegible]	3
2. Puerperal Albuminuria and Convul.	...	4	...	4			1	2	1	...	[illegible]	4
3. Other accidents of Pregnancy, sudden death	..	2	.	2	..	...		2	...	...	[illegible]	2
4. Puerperal Diseases of the Breast		..	..		...	.	.	...		...	[illegible]	
Total	..	9	..	7	1	1	1	6	2	...	[illegible]	9

CARLETON.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas		1		1			1			1																														1	1
2. Skin and Adnexa (cancer excepted)																																									
Total		1		1			1			1																														1	1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease		1		1				1											1											1											1
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total		1		1				1											1											1											1
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	64	56	1	121			121			121																			11	10	6	12	8	15	12	10	6	11	7	15	121
2. Congen. Debil. and Malformations	98	70	1	169			169			169																			10	16	14	1	18	15	26	14	10	11	8	9	169
3. Other Diseases of Infancy	19	12		31			31			25	6																		5	4	3	3	7	3	1	1	1	1	1	1	31
4. Senile Decay	67	55		45	77		10	92	20																	41	81		12	10	15	10	10	7	2	10	10	10	11	15	122
Total	228	193	2	366	77		331	92	20	315	6															41	81		38	40	38	40	43	40	41	35	27	36	27	38	443
XII. SUICIDE.																																									
1. Poison	1			1				1																1										1							1
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning	2			1	1		1	1												1												1					1				2
5. Firearms																																									
Total	3			2	1		1	2												1				1								1		1			1				3
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	2	1		2	1		1	2									1								1		1			1						1				1	3
2. Gunshot	2			2			1	1								1							1															1	1		2
3. Lightning																																									
4. Drowning	3	1	1	3		2	2	1	2							1	1	1				1						1				2	3								5
5. Electric Cars	3			2		1	1	1	1						1		1			1														2					1		3
6. Bicycles																																									
7. Railways	7	1		6		2	2	3	3				1					2	2	1	1					1				3			1	1	1		2				8
8. Burns and Scalds	2	2		4			3	1					2						1						1					1			1					2			4
9. Homicide																																									
10. Other accidents	11	3		11	3		7	5	2	2					2	1	2	1	1	2				1	2					1		1	3	1	1	1	2	2	1	1	14
Total	30	8	1	30	4	5	17	14	8	2			3		3	3	5	4	1	1	1	1	1	1	4	1	1	1		6		3	8	4	2	2	1	5	3	2	39
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	6	5		10		1		9	2													1		1	1	4	4			1		1	1	2	2	2			1	1	11
2. Tumors	7	11		16	2		6	9	3							1	1	3	1	2	1	2		1	2	1				2	1		4	3	3		1		2	2	18
3. Other ill-defined causes	11	12		17	6		4	12	7	1				1	1	0		1	2	4	2			2	1	2	3	3	1	2	2	3		1	3	3	2	3	2	1	23
Total	24	28		43	8	1	10	30	12	1				1	1	1	1	4	6	6	3	3		4	4	7	7	3	1	5	3	4	5	6	8	5	3	3	[illegible]	4	52
Total from all causes	**866**	**754**	**7**	**1311**	**290**	**26**	**915**	**562**	**150**	**541**	**56**	**30**	**6**	**12**	**32**	**27**	**57**	**56**	**52**	**53**	**56**	**40**	**40**	**101**	**143**	**155**	**161**	**9**	**135**	**166**	**139**	**137**	**156**	**127**	**150**	**138**	**111**	**125**	**101**	**142**	**1627**

CAUSES OF DEATHS BY COUNTIES IN 1904.—DUFFERIN.—(Including municipalities of all classes.)

General Diseases.	Sex. Male	Sex. Female	Sex. Not stated	Nativity. Canada	Nativity. Foreign	Nativity. Not stated	Social con. Single	Social con. Married	Social con. Not stated	Ages. Under 5. 0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over	Not given	Months. Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES																																									
1. Typhoid Fever	1	2		3			1	2									2					1											2						1		3
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough	1	1		1	1		2			2																									1	1					2
6. Diphtheria and Croup	1	2		3			3						1		1		1													1				1			1				3
7. Influenza		4		2	2			3	1												2					2			2	2											4
8. Other Epidemic Diseases																																									
Total	3	9		9	3		6	5	1	2			1		1		3				2	1				2			2	3			2	1	1	1	1		1		12
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia		3		3				3											2			1													1	1		1			3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	6	10		15	1		9	6	1			1			1		1	1	2	3	3		2	1	1						1	1	1	3	2	1	3	1	3		16
4. Syphilis																																									
5. Cancer	6	6		6	6			11	1											1				2	3	1	2		2		1		3		5		1				12
6. Rheumatism and Gout																																									
7. Diabetes																																									
8. Other General Diseases	4	2		6			3	3							2			1	1		1				1						2		1	1				1		1	6
9. Alcoholism, Acute and Chronic																																									
Total	16	21		30	7		12	23	2			1			3		1	2	5	1	1	1	2	4	5	1	2		2		1	1	5	1	8	2	4	3	3	1	37
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	2	2		4			4			1	1							2													2			1	1						4
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of Brain		1		1				1																1								1									1
5. Softening of the Brain	1				1			1																		1							1								1
6. Paralysis without specified cause	8	3		4	7		2	9								2						1			3	4	1			3			1			3			3	1	11
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)		1		1				1												1												1									1
10. Other Nervous Diseases		2		1	1		1	1								1										1					1							1			2
Total	11	9		11	9		7	13		1	1					3		2		1		1		1	3	6	1			3	3	2	2	1	1	3		1	3	1	20

DUFFERIN.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	41
IV. CIRCULATORY SYSTEM.											
1. Pericarditis											
2. Endocarditis											
3. Organic Heart Diseases	11	7		11	7		2	16			18
4. Angina Pectoris											
5. Arteries, Atheroma, Aneurism, etc.	1			1				1			1
6. Other Diseases of Circulatory System	6	8		8	10		2	10			14
Total	18	15		6	13		4	27			33
V. RESPIRATORY SYSTEM.											
1. Acute Bronchitis	1	2		2	1		1	2			3
2. Chronic Bronchitis											
3. Broncho-pneumonia	3	4		4	3		1				7
4. Pneumonia	12	10		10	12		6	15			22
5. Pleurisy	1				1			1			1
6. Congestion of the Lungs	2				2			1			2
7. Asthma and Emphysema		1			1			1			1
8. Other Diseases of Respiratory System											
Total	19	17		16	20		11	24	2		36
VI. DIGESTIVE SYSTEM.											
1. Ulcer of the Stomach											
2. Other Diseases of Stomach (cancer excepted)	4	8		5	7		1	16	1		12
3. Infantile Diarrhoea and Cholera Infantum	2	3		5			5				5
4. Diarrhoea and Enteritis (not infantile)											
5. Dysentery											
6. Hernia and Intestinal obstructions	1	1			2						
7. Other Diseases of the Intestines		2		2			2				2
8. Diseases of the Liver		1		1				1			1
9. Peritonitis (not puerperal)		2		1	1			2			2
10. Iliac Abscess and Appendicitis	2	1		3			2				3
Total	9	18		17	10		10	16	1		27
VII. GENITO-URINARY SYSTEM.											
1. Acute Nephritis											
2. Bright's Disease	5	2		3	4			7			7
3. Other Diseases of Kidneys and Adnexa	1	2		3				3			3
4. Vesical Calculi											
5. Diseases of the Bladder	1				1			1			1
6. Diseases of the Male Genital Organs											
7. Metritis											
8. Other Diseases of the Uterus											
9. Ovarian Cysts and other Ovarian Tumors		1		1				1			1
10. Other Diseases of Female Genital Organs											
Total	7	5		7	5			12			12

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions		1		1				4													2		2										1	1			2					4
3. Other Accidents of Pregnancy (sudden death)		1		1				1																1														1				1
4. Puerperal Diseases of the Breast																																									
Total		5		5				5													2		2	1									1	1			2	1				5
IX. THE SKIN.																																									
1. Erysipelas	1			1				1																		1						1										1
2. Skin and Adnexa (cancer excepted)																																									
Total	1			1				1																		1						1										1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still Births	13	8		21			21			21																			2	3	1	1	1	1	2	4	4	1	1		21
2. Congen. Debility and Malformation	18	5		23			23			23																			2	2	1	2	2	1	4	5		1	2	1	23
3. Other Diseases of Infancy																																									
4. Senile Decay	16	13	1	6	23	1	3	27																		6	23	1	4	5	3	1	1		1	2	2	5	1	2	30
Total	47	26	1	50	23	1	47	27		44																6	23	1	8	10	5	7	1	2	7	11	6	7	4	3	71
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENT.																																									
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lightning																																									
4. Drowning																																									
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	1			1				1														1															1				1
8. Burns and Scalds																																									
9. Other Accidents	4	1		5			5			1								1	1	2									1			1	2							1	5
Total	5	1		6			5	1		1								1	1	2		1							1			1	2				1			1	6
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	1	1		2			1	1														1		1								1							1		2
2. Tumors																																									
3. Other Ill Defined Causes	2	2		3	1		1	3		1											1				1		1										1	1		2	4
Total	3	5		5	1		2	4		1											1	1		1	1		1					1					1	1	1	2	
Total from all causes	139	129	1	177	91	1	104	157	8	57	4	2	1	2	5	4	7	9	8	9	11	9	4	19	35	42	39	2	24	35	26	19	22	12	23	27	23	19	24	15	269

CAUSES OF DEATH BY TOWNS IN 1904.—ELGIN.—(Including Municipalities of all Classes.)

General Diseases.	Sex: Male.	Sex: Female.	Sex: Not stated.	Nativity: Canada.	Nativity: Foreign.	Nativity: Not stated.	Soc'l con.: Single.	Soc'l con.: Married.	Soc'l con.: Not stated.	Ages: Under 1	1-	2-	3-	4-	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	January	February	March	April.	May.	June	July	August.	September	October.	November	December	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	2	4		6			4	2							2		1		1		2																2	2		2	6
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	4		6			6					3			2		1												1	1			2	1					1		6
5. Whooping Cough																																									
6. Diphtheria and Croup	3	6		9			9								5	3		1											1	1	1	2		1		1		1		1	9
7. Influenza	6	6		10	1	1	1	10	1	1								1						1		3	6		1	3	3	1			1			2	1		12
8. Other Epidemic Diseases																																									
Total	13	20		31	1	1	20	12	1	1		3			9	3	2	2	1		2			1		3	6		5	5	4	3	2	2	1	1	2	5	2	3	33
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	2		2	3		3	2									1		1				1			2			1	2				1						1	5
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	18	22		32	4	4	21	16	3							3	7	2	8	6	1	3	3	4	2	1			4	2	1	6	6	6	4	3		2	2	4	40
4. Syphilis																																									
5. Cancer	11	16		18	9		5	20	2												1	2	1	7	4	8	1		1	2	2	2	3		2	3	4	2	4	2	27
6. Rheumatism and Gout	3	2		1	1		2	3							1										2	1	1		1	1						1		1		1	5
7. Diabetes																																									
8. Other General Diseases	1	2		5	1			6																1	4	1					1	1		2				1		1	6
9. Alcoholism, Acute and Chronic																																									
Total	39	44		61	18	1	31	47	5						1	3	8	2	9	6	2	5	5	12	12	13	5		7	7	4	9	9	9	6	7	1	6	6	9	83
Local Diseases.																																									
III. DISEASES OF NERVOUS SYSTEM.	4	3		7			4	3		2	1	1							1	1			1						1		1	1		1		2				1	7
1. Encephalitis	5	3		8			6	2		1	1				2		1	1		1		1								2	1			2	1	1	1				8
2. Simple Meningitis	2	1		3			1	2				1											2									2				1					3
3. Epidemic Cerebro-spinal Meningitis	13	8		9	12		5	16								1					1		1	2	10	4	2			3	1	1	3	1	1	2	3	1	3	2	21
4. Congestion and Hemorrhage of Brain		2		1	1			2																	1	1					1								1		2
5. Softening of the Brain	25	22		29	16	2	6	36	5													1	5	5	7	17	11	1	3	13	3	2	5	3	3	3		5	2	5	47
6. Paralysis without specified cause																																									
7. Insanity	1			1			1										1																					1			1
8. Epilepsy	6	5		11			9	1	1	8			1					1						1						3	1			2		1	1	1	1	1	11
9. Convulsions (not puerperal)	2	4		6			5	1			1						1		1		1				2				1		1		1	2			1				6
Total	58	48		75	29	2	37	63	6	11	3	2	1		2	1	3	2	2	2	2	2	9	8	20	22	13	1	5	21	9	6	9	11	5	10	6	8	7	9	106

IV. CIRCULATORY SYSTEM.		
1. Pericarditis	1 2 3 3 2 1 1 1 1	3
2. Endocarditis	1 1 1 1 1 1	1
3. Organic Heart Diseases	19 15 22 12 4 29 1 1 1 2 2 1 4 12 9 2 1 5 6 4 1 3 2 3 1 3 3 2	34
4. Angina Pectoris		
5. Arteries, Atheroma, Aneurism, etc.	1 1 1 1 1	1
6. Other Diseases of Circulatory System	16 17 17 16 8 25 1 1 2 1 1 1 3 4 12 5 2 2 3 5 1 8 4 1 3 4 2	33
Total	37 35 43 29 13 58 1 1 1 1 1 3 3 5 2 7 18 21 7 2 4 8 11 7 9 7 4 3 4 3 8 4	72
V. RESPIRATORY SYSTEM.		
1. Acute Bronchitis	2 1 2 1 2 1 1 1 1 1 1 1	3
2. Chronic Bronchitis	1 1 1 1 1	1
3. Broncho-pneumonia	1 1 1 1 1	1
4. Pneumonia	23 12 30 3 2 15 19 1 7 1 1 2 1 1 1 2 2 4 8 3 2 3 2 7 5 3 4 1 1 5 4	35
5. Pleurisy		
6. Congestion of the Lungs	2 1 1 2 1 2 1 2 1 2	3
7. Asthma and Emphysema		
8. Other Diseases of the Respiratory System		
Total	27 16 34 7 2 19 23 1 9 1 1 2 4 2 1 2 2 4 8 7 3 3 2 7 7 3 1 5 1 3 7 4	13
VI. DIGESTIVE SYSTEM.		
1. Ulcer of the Stomach		
2. Other Diseases of Stomach (cancer excepted)	1 4 5 1 4 1 1 3 1 1 2 1	5
3. Infantile Diarrhœa and Cholera Infantum	12 6 17 1 18 14 4 2 1 1 2 8 2 1	18
4. Diarrhœa and Enteritis (not infantile)		
5. Dysentery	1 3 3 4 1 1 2 2 1	4
6. Hernia and Intestinal obstructions	2 2 3 1 1 3 1 1 1 1 1	4
7. Other Diseases of the Intestines	1 1 1 1 1 1 1 1 1	1
8. Diseases of the Liver	5 5 7 3 10 1 3 2 4 1 4 1 3 1	10
9. Peritonitis (not puerperal)	5 7 11 1 5 7 1 1 2 2 2 1 1 1 1 1 2 1 1 1 2 1 2 1	12
10. Iliac Abscess and Appendicitis	5 1 5 1 3 3 1 1 1 1 1 1 1 3 1 1	6
Total	32 28 18 11 1 29 31 15 4 2 1 2 1 3 1 3 2 1 3 7 3 9 3 4 8 1 6 3 4 1 9 12 4 5 3	60
VII. GENITO-URINARY SYSTEM.		
1. Acute Nephritis	1 1 1 1 1	1
2. Bright's Disease	6 8 11 2 1 1 13 2 2 2 8 1 3 1 2 3 1 1 1 1	14
3. Other Diseases of Kidneys and Adnexa	10 1 6 4 1 1 10 1 1 3 6 1 3 2 2 1 1 1	11
4. Vesical Calculi		
5. Diseases of the Bladder	1 1 1 1 1	1
6. Disease of the Male Genital Organs		
7. Metritis		
8. Other Diseases of the Uterus		
9. Ovarian Cysts and other Ovarian Tumors		
10. Other Diseases of Female Genital Organs		
Total	17 10 18 7 2 2 25 1 2 3 6 14 1 2 3 4 4 5 3 1 3 2	27
VIII. PUERPERAL DISEASES.		
1. Puerperal Septicæmia		
2. Puerperal Albuminuria and Convulsions		
3. Other accidents of Preg. and sudden death	5 5 5 2 3 1 1 1 1 1	5
4. Puerperal Diseases of the Breast		
Total	5 5 5 2 3 1 1 1 1 1	5

ELGIN.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Disease of Bones and Joints																																									
3. Amputation (for unspecified disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	6	8	1	15			15			15																			2	2	2		2	1		1	4		1		15
2. Congenital Debility and Malformations	18	12		30			30			30																			2	4	1	5	5	1	1	1	5	1	1	3	30
3. Other Diseases of Infancy		1		1			1			1																													1		1
4. Senile Decay	27	34		19	42		10	49	2																	16	43	2	3	9	9	3	5	3	2	3	2	5	8	9	61
Total	51	55	1	65	12		56	49	2	46																16	43	2	7	15	12	8	12	5	3	5	11	6	11	12	107
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning	2			2			2													2																	2				2
5. Firearms																																									
6. Other Methods	1				1			1																1								1									1
Total	3			2	1		2	1												2				1								1					2				3
XIII. ACCIDENT.																																									
1. Fractures and Dislocations		1		1				1																			1		1												1
2. Gunshot																																									
3. Lightning																																									
4. Drowning	3	1		1			3	1				1	1					1					1								1			1	1	1					4
5. Electric Cars	1			1			1								1																				1						1
6. Bicycles																																									
7. Railways	5			3	2		3	2							1	1				1		1	1						1	1		1					1			1	5
8. Burns and Scalds	1	1		1	1		1	1				1													1								1							1	2
9. Homicide																																									
10. Other Accidents	7	4		7	4		4	7									1	1	1		1		1		2	2	1	1	2	1	1			1			1	3	1	1	11
11. Poison	1				1			1																			1													1	1
Total	18	7		17	8		12	13				2	1		2	1	1	2	1	1	1	1	3		3	2	3	1	4	2	2	1	1	2	2	1	2	3	1	4	25
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	2	8		5	5		1	8	1														2	2		3	3		2	1	1	1	2				1		1	1	10
2. Tumors	3	2		3	2		1	4												1		1		1	2							1	3	1							5
3. Other Ill-Defined Causes	2	5		5		2	4	3		1								1	1	1			1	1		1			1	1			1	2			1		1		7
Total	7	15		13	7	2	6	15	1	1								1	1	2		1	3	4	2	4	3		3	2	1	2	6	3			2		2	1	22
Total from all causes	302	283	1	412	160	14	227	342	17	83	8	9	3	2	15	12	17	13	19	23	17	15	30	44	72	111	87	6	43	74	56	54	59	47	29	37	46	41	51	49	586

CAUSES OF DEATHS BY COUNTIES IN 1904.—ESSEX.—(Including municipalities of all classes).

General Diseases	Sex. Male	Female	Not stated	Nativity. Canada	Foreign	Not stated	Social con. Single	Married	Not stated	Ages. Under 5. 0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months. January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	13	7		18	2		16	4				1			1	3	5	3	2		2	2	1						2	2	4	3	1			3	1	2		2	20
2. Smallpox																																									
3. Measles		2		2			2			1									1													1	1								2
4. Scarlet Fever	4			3		1	4				1				2	1													2						1	1					4
5. Whooping Cough																																									
6. Diphtheria and Croup	14	13		26	1		25	2		5	4	6	3	1	3	1		2	1									2	5	2	1	3		6				2	3	5	27
7. Influenza	2	8		5	5		2	8		1												2			1	4	2		3	3	3									1	10
8. Other Epidemic Diseases																																									
Total	33	30		51	8	1	49	14		7	5	6	3	1	6	5	5	5	4		2	4	1		1	4	2	2	12	7	8	7	2	6	1	4	1	4	3	8	63
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	3	2		5				5											1			1		1	1	1					1	1	1					1		1	5
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	41	45		74	11	1	43	41	2		2	2			4	1	8	15	20	8	6	6	6	5		3			8	5	13	12	7	6	5	5	6	9	2	8	86
4. Syphilis																																									
5. Cancer	12	16		21	7		2	25	1										1	3	2	1	3	4	3	10	1		3	1	1	1	3	1	6	3	1	5	2	1	28
6. Rheumatism and Gout																																									
7. Diabetes																																									
8. Other General Diseases	1	4		4	1		1	4									1		1		1		1	1								1	2		2						5
9. Alcoholism, Acute and Chronic	2			2				2																1		1						1					1				2
Total	59	67		106	19	1	46	77	3		2	2			4	1	9	15	23	11	9	8	10	12	4	15	1		11	6	15	16	13	7	13	8	8	15	4	10	126
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2	5		7			7			5		1						1															1	2	1		1		1	1	7
2. Simple Meningitis	11	10		19	2		18	3		3	6	2	2	1	2		1	2				1				1			2		2	1	1	2	3	4	3	1		2	21
3. Epidemic Cerebro-spinal Meningitis	2	2		4			3	1		3										1									1				1		1			1			4
4. Congestion and Hemorrhage of the Brain	17	16		19	13	1	3	25	5	2			1							2		1	1	4	9	11	2		4	1	4	2	1		1	6	2	2	3	4	33
5. Softening of the Brain	1			1				1																	1													1			1
6. Paralysis without specified cause	10	8		9	9		1	17															1	2	4	7	4			2	2	2		1	1	2	2	1	4	1	18
7. Insanity																																									
8. Epilepsy		2		2			1	1											2										1									1			2
9. Convulsions (not puerperal)	5	4		8	1		8	1		7	1												1								1	2			1	1	1	1	1	1	9
10. Other Nervous Diseases	1	1		1	1			2															1	1						1			1								2
Total	49	48		70	26	1	41	51	5	20	6	4	3	1	2		1	3	2	3		2	4	7	14	19	6		8	4	9	7	8	5	8	13	9	8	9	9	97

ESSEX.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IV. CIRCULATORY SYSTEM.																				
1. Pericarditis	1			1			1									1				
2. Endocarditis	2	1		2	1			3												
3. Organic Heart Diseases	13	19		22	9	1	7	25							1		1			
4. Angina Pectoris		1		1			1													
5. Diseases of Arteries, Atheroma, Aneurism, etc.	1	3		3	1		1	5												
6. Other Diseases of Circulatory System	10	10		13	7		5	15								2		2	3	1
Total	27	34	..	42	18	1	15	48		...					1	3	1	2	3	1
V. RESPIRATORY SYSTEM.																				
1. Acute Bronchitis	3	5		4	4		1	4		3					1					
2. Chronic Bronchitis	2			1	1			1	1											
3. Broncho Pneumonia	7	5		8	4		10	1	1	4	3	1				1				
4. Pneumonia	21	21		40	5		26	17	2	9	5	1			1		2	1	2	1
5. Pleurisy		2		1		1	1	1											1	
6. Congestion of the lungs (inc. pul. apoplexy)	8	3		9	2		9	2		5	3		1							
7. Asthma and Emphysema		1			1			1												
8. Other Diseases of the Respiratory System.		1		1			1									1				
Total	41	38	..	64	17	1	51	27	4	21	11	5	1		2	2	2	1	3	1
VI. DIGESTIVE SYSTEM.																				
1. Ulcer of the Stomach																				
2. Other Dis's. of the Stomach (cancer excepted)	4	3		5	1	1	2	4	1	2										
3. Infan. Diarr. and Cholera Infantum	18	18		36			36			30	2	1	2	1						
4. Diarrhœa and Enteritis (not Infantile)	1	3		3	1			4										1		
5. Dysentery	1	1			2			2												
6. Hernia and Intestinal obstructions	1	3		2	2		2	2		1			1							
7. Other Diseases of the Intestines	1	1		2				1	1										2	
8. Diseases of the Liver	5	4		5	4		2	6	1					1						
9. Peritonitis (not puerperal)	9			8	1		4	3	2						1		2	2		
10. Iliac Abscess and Appendicitis	2			2			2									2				
Total	42	33	...	63	11	1	48	22	5	33	2	1	3	2	1	2	2	3	2	.
VII. GENITO-URINARY SYSTEM.																				
1. Acute Nephritis	7	1		7	1		3	1	4				1			1	1			1
2. Bright's Disease	2	3		3	2		1	4												
3. Other Diseases of Kidneys and Adnexa		3		2	1			2												
4. Vesical Calculi																				
5. Diseases of the Bladder																				
6. Diseases of the Male Genital Organs																				
7. Metritis																				
8. Other Diseases of the Uterus																				
9. Ovarian Cysts and other Ovarian Tumors																				
10. Other Diseases of the Female Genital Organs.		1		1				1												
Total	9	8	....	13	4	....	4	9	4	....			1			1	1			1

Number of Column.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																					
1. Pericarditis														1							1
2. Endocarditis	1					1	1		1			1	1								3
3. Organic Heart Diseases	1	2	5	5	6	11			2	1	7	2	1		3	1	3	6	1	5	32
4. Angina Pectoris						1			1												1
5. Diseases of Arteries, Atheroma, Aneurism, etc.					1	2	1			1		2						1			4
6. Other Diseases of Circulatory System			3	3	3	2	1		4	1	1	2		2		2	1	2	1	1	20
Total	2	2	8	8	10	17	3	.	8	3	8	7	2	3	3	3	4	9	5	6	61
V. RESPIRATORY SYSTEM.																					
1. Acute Bronchitis						2	2		1	2		1	3					1			8
2. Chronic Bronchitis				1		1				1									1		2
3. Broncho Pneumonia				1		1		1	1		2	2	3	2					1	1	12
4. Pneumonia		1	1	2	8	6	2		2	5	8	6	6	5	2		1		3	7	45
5. Pleurisy		1												1						1	2
6. Congestion of the lungs (inc. pul. apoplexy)				1		1			1	2		2	2		1		1		1	1	11
7. Asthma and Emphysema					1					1											1
8. Other Diseases of the Respiratory System.											1										1
Total		2	1	5	9	11	4	1	5	11	11	11	14	8	3	.	2	1	6	10	82
VI. DIGESTIVE SYSTEM.																					
1. Ulcer of the Stomach																					..
2. Other Dis's. of the Stomach (cancer excepted)				2	1	2				1			1			1		2	2		7
3. Infan. Diarr. and Cholera Infantum									3			1		1	3	12	9	5		2	36
4. Diarrhœa and Enteritis (not Infantile)				1	2					1					1	2					4
5. Dysentery					1		1									1	1				2
6. Hernia and Intestinal obstructions				1	1									1		1		2			4
7. Other Diseases of the Intestines									1				1								2
8. Diseases of the Liver		3		1	1	2	1			1			1	2	2		2		1		9
9. Peritonitis (not puerperal)			1	1	1			1	1				2		1	1		2		2	9
10. Iliac Abscess and Appendicitis																1			1		2
Total	.	3	1	6	7	4	2	1	5	3		1	5	4	7	19	12	11	4	4	75
VII. GENITO-URINARY SYSTEM.																					
1. Acute Nephritis					4				1		2	1	1				1	1	1		8
2. Bright's Disease					4	1							1			1	1	2			5
3. Other Diseases of Kidneys and Adnexa	1				2				1		1							1			3
4. Vesical Calculi																					
5. Diseases of the Bladder																					......
6. Diseases of the Male Genital Organs																					
7. Metritis																					
8. Other Diseases of the Uterus																					...
9. Ovarian Cysts and other Ovarian Tumors																					
10. Other Diseases of the Female Genital Organs.	1																		1		1
Total	2				10	1			2	.	3	1	2			1	2	4	2	..	17

	Total
VIII. PUERPERAL DISEASES	
1 Puerperal Septicaemia	2
2 Puerperal Albuminuria and Convulsions	2
3 Other accidents of Pregnancy, sudden death	4
4 Puerperal Disease of the Breast	....
Total	8
IX. DISEASES OF THE SKIN	
1 Erysipelas	1
2 Skin and Adnexa (cancer excepted)	....
Total	1
X. LOCOMOTOR SYSTEM	
1 Pott's Disease	....
2 Diseases of the Bones and Joints	....
3 Amputation (for unspecified Diseases)	....
Total	....
XI. MALFORMATIONS, ETC	
1 Still Births	54
2 Congen. Debility and Malformation	62
3 Other Diseases of Infancy	10
4 Senile Decay	78
Total	204
XII. SUICIDE	
1 Poison	....
2 Strangulation	1
3 Gas Poisoning	....
4 Drowning	....
5 Firearms	....
6 Not stated	1
Total	2
XIII. ACCIDENTS	
1 Fractures and Dislocations	1
2 Gunshot	1
3 Lightning	....
4 Drowning	3
5 Electric Cars	....
6 Bicycles	....
7 Railways	6
8 Burns and Scalds	2
9 Homicide	1
10 Other accidents	8
11 Poison	1
Total	25
XIV. ILL DEFINED CAUSES	
1 Dropsy	5
2 Tumors	7
3 Other Ill Defined Causes	11
Total	23

Total from all causes	399	385	615	160	9	407	350	27	207	30	18	13	5	16	15	24	33	43	20	20	23	26	42	62	108	71	6	73	56	78	79	77	49	50	83	54	66	51	68	784

CAUSES OF DEATHS BY COUNTIES IN 1904. FRONTENAC - (Including municipalities of all classes).

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social cond. Single.	Social cond. Married.	Social cond. Not stated.	Ages. Under 5. 0-1.	Under 5. 1-	Under 5. 2-	Under 5. 3-	Under 5. 4-	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given.	Months. Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	7	2		8	1			1									1	2	2		2			2					1			1	1		1	3			1	1	9
2. Smallpox																																									
3. Measles	1			1			1			1																			1												1
4. Scarlet Fever																																									
5. Whooping Cough		1		1			1				1																						1								1
6. Diphtheria and Croup	4	8		12			12			3	1	1	1		1		2												4		1	1	1	1			1	1	2		12
7. Influenza	3	2		3	2		2			2															1		2				1	1			2					1	5
8. Other Epidemic Diseases																																									
Total	15	13		25	3		21	7		6	5	1	1		1		3	2	2		2			2	1		2		6		2	3	3	1	3	3	1	1	3	2	28
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	3	2		1	1		3	2								1	2				1				1				1		2		1					1			5
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	33	36		59	9	1	34	32	3		1			1	3	2	7	11	9	5	6	5	6	8	4	1			4	9	6	8	4	4	11	9	3	4	3	4	69
4. Syphilis																																									
5. Cancer	11	12		12	12	2	1	22	3										1		2	1	1	5	9	5	2		1	2	3	2	3	2	4	2	2	1	1	3	26
6. Rheumatism and Gout	5	3		1	1		5	3					1								1	1		1	3	1			2		1					1	1	1	1	1	8
7. Diabetes	1	2		2	1		1	2										1		1						1												2	1		3
8. Other General Diseases		5		4		1	2	2	1									1		1	1			1	1				1	1	1					1			1		5
9. Alcoholism, Acute and Chronic																																									
Total	56	60		85	27	4	46	63	7		1		1	1	3	3	9	13	10	7	11	7	7	15	18	8	2		9	12	13	10	8	6	15	13	6	9	7	8	116
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	5	3		8			7	1		2	3	1			1										1						2	1			2	2	1				8
2. Simple Meningitis	6	6		12			12			1	1		1			2		1	2						1						1		2		4	1	3	1			12
3. Epidemic Cerebro-spinal Meningitis	1			1			1			1																										1					1
4. Congestion and Hemorrhage of Brain	6	10		12	3	1	8	8				1	1		1	1	1		1				1	2	3	1	3		1	2	6		1	1	1	1	1	1		1	16
5. Softening of the Brain	1			1				1																			1						1								1
6. Paralysis without specified cause	23	30		32	21		12	38	3										2		2	2	3	6	11	21	6		2	4	8	6	2	3	5	4	2	6	6	5	53
7. Insanity	1	2		2			2	1														1		1	1						1									2	3
8. Epilepsy	1	1		2				2														1		1							1								1		2
9. Convulsions (not puerperal)	9	1		10			10			6		2	1	1																	2				5	1	2				10
10. Other Nervous Diseases		2		1	1		1	1			1													1					1				1								2
Total	53	55		82	25	1	53	52	3	13	5	4	3	1	2	3	1	1	5		2	4	4	11	17	22	10		4	6	21	7	7	4	17	10	9	8	7	8	108

IV.—CIRCULATORY SYSTEM																																									
1. Pericarditis	1			1			1				1																						1								1
2. Endocarditis	2	1		1	2			3																	1	2						1	2								3
3. Organic Heart Diseases	24	19		24	19		12	25	6									2	1		1	3	3	6	14	8	5		5	6	3	2	2	1	4	4	2	4	3	7	43
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System	13	12		15	10		5	19	1				1				1				1		1	5	9	5	2		2	1	3	5	3		3	2	3		1	2	25
Total	40	32		41	31		18	47	7		1		1				1	2	1		2	3	4	11	24	15	7		7	7	6	8	8	1	7	6	5	4	4	9	72
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	1			1				1																		1											1				1
2. Chronic Bronchitis	1				1			1																		1													1		1
3. Broncho-pneumonia	1				1			1																	1					1											1
4. Pneumonia	20	18		28	9	1	21	15	2	13	2				1	1		1	1		2	1	2		5	5	4		2	7	1	4	6	3	1	1	1	2	7	3	38
5. Pleurisy																																									
6. Congestion of the Lungs, including pul. apop.	3	1		3	1		3	1		3															1					1					1	1				1	4
7. Asthma and Emphysema	2			2			1	1																	2								1				1				2
8. Other Diseases of Respiratory System		1			1			1											1												1										1
Total	28	20		31	15	1	25	21	2	16	2				1	1		1	2		2	1	2		9	7	4		2	9	2	4	7	3	2	2	3	2	8	4	48
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	4	5		7	1	1	5	4											1	1		1		2	2	2			1	1	2		1		2			1	1		9
3. Infantile Diarrhœa and Cholera Infantum	4	7		11			11			10	1																		1			1				4	2	1	1	1	11
4. Diarrhœa and Enteritis (not infantile)	1				1			1																			1		1												1
5. Dysentery																																									
6. Hernia and Intestinal obstructions	5	2		6	1		4	3			1				1							2		1		2				1		1	1			2			2		7
7. Other Diseases of the Intestines		2		2			1	1														1		1												1			1		2
8. Diseases of the Liver	7	1		3	5		1	7														1		1	3	2		1		1		2		1				1		3	8
9. Peritonitis (not puerperal)		4		4			2	2							1	1			1							1										2		1		1	4
10. Iliac Abscess and Appendicitis	3	6		9			7	1	1						1	4		1		2			1						1	1		1	1		1				1	3	9
Total	21	30		42	8	1	31	19	1	16	2				3	5		1	2	3		5	1	5	5	7	1	1	4	4	2	5	3	1	3	9	2	4	6	8	51
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	6	3		4	5		1	8																1	4	4			1	1	1	1	2		2	1					9
3. Other Diseases of Kidneys and Adnexa	5	3		4	4		3	5							1				1		2		1	1	1	1				2	2	2		1				1			8
4. Vesical Calculi		1		1				1														1								1											1
5. Diseases of the Bladder	1			1				1																		1							1								1
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	12	7		10	9		4	15							1				1		2	1	1	2	5	6			1	4	3	3	3	1	2	1		1			19
VIII. PUERPERAL DISEASES.																																									
1. Peurperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other Accidents of Pregnancy, sudden death		4		4				4											1	1	1	1										1		3							4
4. Puerperal Disease of the Breast																																									
Total		4		4				4											1	1	1	1										1		3							4

FRONTENAC. *Continued.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1				1				1																	1							1								1
2. Skin and Adnexa (cancer excepted)																																									
Total	1				1				1																	1							1								1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified Diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	11	9	2	22			22			22																				1	3	2	1	3	1	2	1	3	3	2	22
2. Congen. Debility and Malformations	18	26	1	45			45			44	1																		8	7	5	1	2	3	5	4	6	4			45
3. Other Diseases of Infancy																																									
4. Senile Decay	30	44		29	45		8	64	2																1	23	50		7	9	8	8	8	5	2	6	4	5	6	6	74
Total	59	79	3	96	45		75	64	2	66	1														1	23	50		15	17	16	11	11	11	8	12	11	12	9	8	141
XII. SUICIDE.																																									
1. Poison	1			1				1															1																1		1
2. Strangulation	2			1	1		1	1										1				1							1						1						2
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Other methods	1					1	1																					1											1		1
Total	4			2	1	1	2	2										1				1	1					1	1						1				2		4
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot	2			2			2										1	1												1										1	2
3. Lightning																																									
4. Drowning	2	2		2	2		2	2								1				1				1	1									1		1	1			1	4
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	2			2			2								1						1											1							1		2
8. Burns and Scalds		1		1				1																			1													1	1
9. Homicide																																									
10. Other Accidents	5	2		3	2	2	2	4	1	1									1		1			2			1	1	2					1		1		2		1	7
11. Poison	1			1			1										1												1												1
Total	12	5		11	4	2	9	7	1	1					1	1	2	1	1	1	2			3	1		2	1	3	1		1		2		2	1	2	1	4	17
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	14	3		12	5		4	13													1	1	2	1	7	3	2		2	2	1	2	3			1	1	3	1	1	17
2. Tumors	2	2		3	1		4										2	1							1					1		1		1	1						4
3. Other Ill-Defined Causes	3	7		7	5		3	7										1						2	4	1		2		1	1	1		1	2	1	1	1		1	10
Total	19	12		22	9		11	20									2	2			1	1	2	3	12	4	2	2	2	4	2	4	3	2	3	2	2	4	1	2	31
Total from all causes	320	317	3	454	176	10	295	321	24	112	17	5	6	2	12	13	18	24	25	12	25	24	22	52	93	93	80	5	54	64	67	57	54	35	61	60	40	47	48	53	640

CAUSES OF DEATHS BY COUNTIES IN 1904.—GREY.—(Including municipalities of all classes.)

General Diseases.	Sex.			Nativity.			Social Con.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not Stated.	0.	1.	2.	3.	4.	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	1	1		6	2		4	4							1	1		3	1				1	1										1		1	1	2	1	2	8
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	5		6	1		7				1		1	1	1	3															4	1					1			1	7
5. Whooping Cough	4	3		7			7			5	2																			2					4	1					7
6. Diphtheria and Croup	9	3		12			12			2	1		1		5	1	1											1	1	2	3	1	1				1			3	12
7. Influenza	2	5		6	1		4	3		3	1												1	1		1				2	1	2					1	1			7
8. Other Epidemic Diseases		1		1			1									1																1									1
Total	21	21		38	1		35	7		10	5		2	1	7	6	1	3	1				2	2		1		1	1	6	8	5	1	1	4	2	4	3	1	6	42
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1				1			1																		1							1								1
2. Malarial Fever	3	1		4			4			2					1			1															1			2	1				4
3. Tuberculosis and Scrofula	34	39		64	9		39	33	1			1			1	2	7	15	7	11	8	6	2	4	6	3			7	7	7	6	4	7	8	8	4	5	3	7	73
4. Syphilis																																									
5. Cancer	22	21		29	13	1	4	37	2											2	3	1	6	10	9	10	2		2	4	3	8	10	1	4	2	1	2	4	2	43
6. Rheumatism and Gout		1			1		1																			1									1						1
7. Diabetes	3			3			2	1				1						1	1										1	1										1	3
8. Other General Diseases	10	4		10	4		5	7	2				1				2	2	2		2	1		2	1		1				1	1		2	8			1		1	14
9. Alcoholism, Acute and Chronic																																									
Total	73	66		110	28	1	55	79	5	2		2	1		2	2	9	19	10	13	13	8	8	16	16	15	3		10	12	11	15	16	10	21	12	6	8	7	11	139
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	5	6		10	1		8	2	1	1	1				1	2		2	2				1			1			2	1			1	1	1	2	1	1		1	11
2. Simple Meningitis	5	6		11			9	2		2	2					1			2			2			1	1				2	1	2				1	2		1	2	11
3. Epidemic Cerebro-spinal Meningitis	2	2		4			4			1			1	1											1										2		1		1		4
4. Congestion and Hemorrhage of the Brain	8	12		6	14		1	17	2														2		7	5	6		2	1	3	3	3	1		1	2	2	2		20
5. Softening of the Brain																																									
6. Paralysis without specified cause	10	13		8	15		2	21																1	6	13	3			4	6	1	2	2	3		3	1		1	23
7. Insanity	1	1		1	1			2												1						1				1							1				2
8. Epilepsy	2	2		4			2	2										2	1								1					1	1		2						4
9. Convulsions (not puerperal)	12	4		16			16			10	6																		3			4	4		1	1	1	2			16
10. Other Nervous Diseases	4	1		5				3	2													1		1	2	1					1	1			1		1			1	5
Total	49	47		65	31		42	49	5	14	9		1	1	1	3		4	5	1		3	3	2	17	22	10		7	9	11	12	11	4	10	5	12	6	4	5	96

GREY.—*Continued.*

Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis		2			2		1	1																		2											2				2
3. Organic Heart Disease	17	30		19	28		7	38	2							2	1	1	1	2	1		1	6	14	14	4		10	5	2	3	4	4	2	2	1	3	2	9	47
4. Angina Pectoris	1				1			1																		1			1												1
5. Diseases of Arteries, Atheroma, Aneurism, etc	5	2		3	1			7														1	1	1	1	1	2			1				1	1		2			2	7
6. Other Diseases of the Circulatory System	4	4		5	6		2	6												1	1		2	2	2				2			2		1					2	1	8
Total	27	38		27	38		10	53	2							2	1	1	1	3	2	1	4	9	17	18	6		13	6	2	5	4	6	3	2	5	3	4	12	65
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	15	8		21	2		16	7		11	1								1				1		2	3	1		2	5	4	1	3						5	3	23
2. Chronic Bronchitis	5	1		4	5		1	8															2		2	5					1			1	2			2	3		9
3. Broncho-pneumonia	7	5		9	3		7	5		5	1	1											2			2	1		1	1		1	2	1		2		2	1	1	12
4. Pneumonia	23	15		25	11		17	17	2	3	2		2	1			2	1	2	1	1	1	2	1	8	7	1	1	1	4	6	4	5	2		2	1		5	6	36
5. Pleurisy	3	3		2	4		1	5			1													1	3	1				1		1		1				1	2		6
6. Congestion of the Lungs, (inc. pul. apoplexy)	8	5		9	4		7	6		5	1	1											1		2	2	1				2	3	2	1	1		2		1	1	13
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	61	38		70	29		19	48	2	27	6	2	2	1			2	1	3	1	1	1	8	2	17	20	4	1	1	11	13	10	12	6	3	4	3	5	17	11	99
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	2	1		2	1			3												1		1			1											2				1	3
2. Other Diseases of Stomach (cancer excepted)	5	9		8	4		7	5		3	2													2	5						4	1		1		2	1	1	2		12
3. Infantile Diarrhœa and Cholera Infantum	12	4		16			16			13	2	1																	1	2				1	1	1	5	2	1	2	16
4. Diarrhœa and Enteritis (not infantile)		2		2	2		1	2	1										1			1					2							1		1		1	1		4
5. Dysentery	1	2		2	1		1	2					1												1		1							2			1				3
6. Hernia and Intestinal obstructions		3		1	2			3																	1	1	1			2		1									3
7. Other Diseases of the Intestines	5	3		6	2		3	4	1		1	1				1							1		2	2								3			2	3			8
8. Diseases of the Liver	6	5		7	1		2	8	1	2												1		3	2	3				3	2	1	1		1				1	2	11
9. Peritonitis (not puerperal)	3	4		6		1	4	3							2	1	1	1	1									1		1		2			1						7
10. Iliac Abscess and Appendicitis	6	2		7	1		5	3								2	2		1	2			1							2			1		2			3			8
Total	40	35		57	17	1	39	33	3	18	5	2	1		2	4	3	1	3	3		3	2	5	12	6	4	1	1	13	6	5	2	8	5	6	9	10	5	5	75
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	7	2		4	5			8	1									1		1			1	1	2	1	2		1		3		1		1		2	1			9
3. Other Diseases of the Kidneys and Adnexa	2	2		2	2		1	3										1							1		2			1					1			1	1		4
4. Vesical Calculi																																									
5. Diseases of the Bladder	3	1		2	2			4																	1	1	2			1				2					1		4
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs		1		4			2	2											1		1	2									1	1					2				4
Total	12	9		12	9		3	17	1									2	1	1	1	2	1	1	4	2	6		1	2	4	1	1	2	2		4	2	2		21
VIII. PUERPERAL DISEASES																																									
1. Puerperal Septicaemia																																									
2 Puerperal Albuminaria and Convulsions		2		2				2										1				1									1			1							2

3. Other Accidents of Pregnancy, sudden death		6	1	2		1	5										1	1	3	1										1		1		1	3					6
4. Puerperal Disease of the Breast																																								
Total		8	6	2		1	7										2	1	3	1	1									2		1	1	1	3					8
IX. THE SKIN.																																								
1. Erysipelas	4	1	3	1	1	1	1					1									1		1	1	1			1	1		1						1	1		5
2. Skin and Adnexa (cancer excepted)																																								
Total	4	1	3	1	1	1	1					1									1		1	1	1			1	1		1						1	1		5
X. LOCOMOTOR SYSTEM.																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints		1		1			1															1														1				1
3. Amputation for unspecified Diseases																																								
Total		1		1			1															1														1				1
XI. MALFORMATIONS, ETC.																																								
1. Still-Births	21	9	30			30			30																			2	2	5	1	3	2	1	2	2	1	3	3	30
2. Congenital Debility and Malformations	36	25	61			61			61																			5	2	5	6	4	8	5	9	3	2	6	6	61
3. Other Diseases of Infancy	4	2	6			6			1	3	1	1																		1	3	1						1		6
4. Senile Decay	87	71	19	138	1	6	144	8																5	55	98		13	30	16	14	12	8	7	8	7	7	20	16	158
Total	148	107	116	138	1	103	144	8	92	3	1	1												5	55	98		20	31	27	27	20	18	13	19	12	10	30	25	255
XII. SUICIDE.																																								
1. Poison		1	1			1												1											1											1
2. Strangulation	1	1	1	1			2																1	1											1				1	2
3. Gas Poisoning																																								
4. Drowning																																								
5. Firearms																																								
Total	1	2	2	1		1												1					1	1					1						1				1	3
XIII. ACCIDENTS.																																								
1. Fractures and Dislocations	1	1		2		1	1																	1	1				1							1				2
2. Gunshot	3		2	1		2	1				1						2													1				1		1				3
3. Lightning																																								
4. Drowning	5		1	1		6	2							1		1		1			1	1									1			2	1	1				5
5. Electric Cars																																								
6. Bicycles																																								
7. Railways	2			2		1	1															2									1		1							2
8. Burns and Scalds																																								
9. Homicide																																								
10. Other Accidents	15	4	11	3		10	7			2				1		1	1	1	3	1	3		1		2	1		1	3	3	2	1		2			1	2	2	17
Total	21	5	20	9		17	12			2	1			2		2	3	2	3	1	4	3	1	1	8	1		1	4	4	4	1	1	5	1	3	1	2	2	29
XIV. ILL-DEFINED CAUSES.																																								
1. Dropsy	9	8	6	11		7	11	3													2		4	3	5	3		2	3	1		3	1	1		1	1	1	3	17
2. Tumors	1	8	6	3		4	5		1			2		1			1			1				1	1	1		1			1	1		1		1		4		9
3. Other Ill defined Causes	8	8	10	6		7	8	1	3						1	1				1	1	1	1	2	3		2	1	3	4	4		1			1	2			16
Total	18	24	22	20		14	21	1	1			2		1	1	1	1			2	3	1	5	6	9	4	2	4	6	5	5	4	2	2		3	3	5	3	42
Total from all Causes	478	402	548	328	4	370	480	30	167	30	8	11	3	15	18	19	37	28	28	21	27	33	45	97	152	136	5	63	105	93	90	73	59	69	55	62	52	78	81	880

CAUSES OF DEATHS BY COUNTIES IN 1904.—HALDIMAND.—(Including municipalities of all classes).

General Diseases.	Sex.			Nativity.			Social Con.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canadian.	Foreign.	Not stated.	Single.	Married.	Not stated.	1 0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over.	Not given.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	1			1			1											1																		1					1
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	1	4		5			5					1	1		2	1													3	2											5
5. Whooping Cough	1			1			1			1																							1								1
6. Diphtheria and Croup	2	1		3			3				1				1	1																1								2	3
7. Influenza	1	2			3			3																		1	2		1		2										3
8. Other Epidemic Diseases																																									
Total	6	7		10	3		10	3		1	1	1	1		3	2		1								1	2		4	2	2	1	1			1				2	13
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia		3		3			2	1										1					1			1					1		1		1						3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	9	8		12	5		4	12	1		1						2		1	2	1	1	2	1	3	3				2	2	1	2	1	2	1	3	1	1	1	17
4. Syphilis																																									
5. Cancer	8	3		5	6		2	9												1			1	1	1	6	1		2	1		1	1	2		1		1	2		11
6. Rheumatism and Gout	1	1		2				2														1		1								1								1	2
7. Diabetes	1	2		3			1	2								1							1		1				1					1		1					3
8. Other General Diseases		2		2				2															1		1					1									1		2
9. Alcoholism, Acute and Chronic																																									
Total	19	19		27	11		9	28	1		1					1	2	1	1	3	1	2	6	3	6	10	1		3	4	3	3	4	4	3	3	3	2	4	2	38
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1	3		4			2	2			1	1													1	1			1	2				1							4
2. Simple Meningitis	1	2		3			3				1				2														1			2									3
3. Epidemic Cerebro-spinal Meningitis																																									2
4. Congestion and Hemorrhage of Brain	1	1			2			2																		1	1			1		1									
5. Softening of the Brain		1		1			1											1																		1					1
6. Paralysis without specified cause	9	6		8	7		1	13	1										1				1	2	3	1	7		1	1		2	4	1	3	1			1	1	15
7. Insanity																																									
8. Epilepsy	1			1				1																1								1									1
9. Convulsions (not puerperal)	1	2		2	1		1	2		1								2																			2	1			3
10. Other Nervous Diseases	1				1			1																			1		1												1
Total	15	15		19	11		8	21	1	1	2	1			2			3	1				1	3	4	3	9		4	4		6	4	2	3	2	2	1	1	1	30

IV. CIRCULATORY SYSTEM.																																								
1. Pericarditis																																								
2. Endocarditis																																								
3. Organic Heart Diseases	16	10		11	10	2	4	21	1											1			2	3	8	8	4		1	1	5	6	4	3	1	1			3	1	26
4. Angina Pectoris																																								
5. Diseases of Arteries, Atheroma, Aneurism, etc.	1	1			1	1		2																	2										1			1		2
6. Other Diseases of the Circulatory System	3	1		2	2		1	3										1							2	1		1				2						1		4
Total	20	12		16	13	3	5	26	1										1	1			2	3	10	10	5		2	1	5	6	6	3	1	2			5	1	32
V. RESPIRATORY SYSTEM.																																								
1. Acute Bronchitis	2	1		3			3			2		1																		1		1									1	3
2. Chronic Bronchitis																																								
3. Broncho-pneumonia	2			1	1		1	1		1																1									1	1							2
4. Pneumonia	11	8		11	5		3	16		1						1	1			1		1	2	2	6	3	1		1	6	2	2	3	2		1			1	1	19
5. Pleurisy	2				2			2																			2						2									2
6. Congestion of the Lungs (inc. pul. apoplexy)	3	1		4			3		1	2																1	1			1	1					1				1		4
7. Asthma and Emphysema	2			1	1			2																		1	1				1		1								2
8. Other Diseases of the Respiratory System																																								
Total	22	10		23	9		10	21	1	6		1				1	1			1		1	2	2	9	7	1		3	8	5	3	4	3	1	1			2	2	32
VI. DIGESTIVE SYSTEM.																																								
1. Ulcer of the Stomach	1			1				1																1															1			1
2. Other Dis's. of the Stomach (Cancer excepted)		1			1			1																	1				1												1
3. Infan. Diarr. and Cholera Infantum	2	1		3			3			3																											2	1				3
4. Diarrhœa and Enteritis (not infantile)																																								
5. Dysentery																																								
6. Hernia and Intestinal obstructions		3		2	1		1	2												1		1			1			1	1	1											3
7. Other Diseases of the Intestines																																								
8. Diseases of the Liver	1	3			1			4													1		2		1						2	1			1					4
9. Peritonitis (not puerperal)	2			1	1		1	1		1																1									1					1			2
10. Iliac Abscess and Appendicitis	1	1		2			2								1			1																	1					1			2
Total	7	9		12	4		7	9		4				1			1				1	1	1	3	2	2			2	1	1	2	3			3	1	3			16
VII. GENITO-URINARY SYSTEM.																																								
1. Acute Nephritis																																								
2. Bright's Disease	4			1	3			4															1		2	1						2		2								4
3. Other Diseases of the Kidneys and Adnexa	4			1	3			4																1		2	1			1		1			1	1				4
4. Vesical Calculi																																								
5. Diseases of the Bladder																																								
6. Diseases of the Male Genital Organs																																								
7. Metritis																																								
8. Other Diseases of the Uterus																																								
9. Ovarian Cysts and other Ovarian Tumors		1		1				1																1						1										1
10. Other Diseases of the Female Genital Organs																																								
Total	8	1		3	6			9														1	2	2	3	1			1	1	3		2	1	1				9
VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicæmia																																								
2. Puerperal Albuminuria and Convulsions																																								
3. Other Accidents of Pregnancy, sudden death		2		2				2													1	1									1		1								2
4. Puerperal Disease of the Breast																																								
Total		2		2				2													1	1									1		1								2

HALDIMAND.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1			1				1																	1					1											1
2. Skin and Adnexa (cancer excepted)																																									
Total	1			1				1																	1					1											1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	6	4		10			10			10																			1	1	2	1			1	1	2			1	10
2. Congen. Debil. and Malformations	8	9		17			17			17																			2	1	1	2	3	4	1			2	1		17
3. Other Diseases of Infancy	1	2		3			3			2		1																		1			1					1			3
4. Senile Decay	21	18		12	27		2	37																	2	7	30		3	5	6	2	2	1	3	2	1	3	5	6	39
Total	36	33		42	27		32	37		29		1													2	7	30		6	8	9	5	6	5	5	3	3	6	6	7	69
XII. SUICIDE.																																									
1. Poison		1			1			1											1														1								1
2. Strangulation		1			1			1																	1															1	1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Other methods	1			1				1																1														1			1
Total	1	2		1	2			3											1					1	1								1					1		1	3
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lightning		1		1				1												1																1					1
4. Drowning	3	1		1			1	2	1				2			1	1																1		1					2	4
5. Electric Cars																																									
6. Bicycles																																									
7. Railways																																									
8. Burns and Scalds	1			1				1														1							1												1
9. Other accidents	3			2	1			3								1			1					1											1		1		1		3
10. Poison		2		2				2													1		1						1					1							2
Total	7	4		10	1		1	9	1				2			2	1		1	1	1	1	1	1					2				1	1	2	1	1		1	2	11
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	4	2		3	3		1	5													1			1	1	2	1		1	1	2			1				1			6
2. Tumors		1		1			1			1																							1								1
3. Other Ill-Defined Causes	3			2	1		1	2		1													1		1										1		2				3
Total	7	3		6	4		3	7		2											1		1	1	2	2	1		1	1	2		1	1	1		2	1			10
Total from all causes	149	117		172	91	3	85	176	5	43	4	4	3	1	5	6	5	5	5	7	5	5	15	19	39	45	50		27	32	28	30	31	21	17	17	12	14	19	18	266

CAUSES OF DEATHS BY COUNTIES IN 1904.—HALIBURTON.—(Including municipalities of all classes).

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social Con. Single.	Social Con. Married.	Social Con. Not stated.
Number of Column.	1	2	3	4	5	6	7	8	9
I. COMMUNICABLE DISEASES									
1. Typhoid Fever	2			2			1		1
2. Smallpox									
3. Measles									
4. Scarlet Fever									
5. Whooping Cough									
6. Diphtheria and Croup	3	1		4			4		
7. Influenza	1	1		2				2	
8. Other Epidemic Diseases									
Total	6	2		8			5	2	1
II. OTHER GENERAL DISEASES									
1. Pyaemia and Septicaemia		2		2			1	1	
2. Malarial Fever									
3. Tuberculosis and Scrofula	3	4		6	1		1	2	1
4. Syphilis									
5. Cancer	3	1		2	2			3	1
6. Rheumatism and Gout		1		1				1	
7. Diabetes	1			1			1		
8. Other General Diseases									
9. Alcoholism, Acute and Chronic									
Total	7	8		12	3		6	7	2
Local Diseases.									
III. NERVOUS SYSTEM.									
1. Encephalitis									
2. Simple Meningitis	1			1			1		
3. Epidemic Cerebro-spinal Meningitis	1			1			1		
4. Congestion and Hemorrhage of Brain									
5. Softening of the Brain		1			1			1	
6. Paralysis without specified cause	1	1		1	1			2	
7. Insanity									
8. Epilepsy		1		1			1		
9. Convulsions (not puerperal)	1	3		4			4		
10. Other Nervous Diseases									
Total	4	6		8	2		7	3	

General Diseases.	Under 5. 0.	1.	2.	3.	4.	5–9.	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 and over.	Not given.
Number of Column.	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
I. COMMUNICABLE DISEASES																			
1. Typhoid Fever									1						1				
2. Smallpox																			
3. Measles																			
4. Scarlet Fever																			
5. Whooping Cough																			
6. Diphtheria and Croup		1				3													
7. Influenza															1		1		
8. Other Epidemic Diseases																			
Total		1				3			1						2		1		
II. OTHER GENERAL DISEASES																			
1. Pyaemia and Septicaemia								1	1										
2. Malarial Fever																			
3. Tuberculosis and Scrofula									1	1	1						1		
4. Syphilis																			
5. Cancer													1		1	1	1		
6. Rheumatism and Gout													1						
7. Diabetes									1										
8. Other General Diseases																			
9. Alcoholism, Acute and Chronic																			
Total								1	3	4	1		2		1	1	2		
Local Diseases.																			
III. NERVOUS SYSTEM.																			
1. Encephalitis																			
2. Simple Meningitis							1												
3. Epidemic Cerebro-spinal Meningitis							1												
4. Congestion and Hemorrhage of Brain																			
5. Softening of the Brain																1			
6. Paralysis without specified cause																1	1		
7. Insanity																			
8. Epilepsy									1										
9. Convulsions (not puerperal)	2	1				1													
10. Other Nervous Diseases																			
Total	2	1				1	2		1							2	1		

General Diseases.	Months. Jan.	Feb.	March	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES													
1. Typhoid Fever					1				1				2
2. Smallpox													
3. Measles													
4. Scarlet Fever													
5. Whooping Cough													
6. Diphtheria and Croup	1				2						1		4
7. Influenza		1	1										2
8. Other Epidemic Diseases													
Total	1	1	1		3				1		1		8
II. OTHER GENERAL DISEASES													
1. Pyaemia and Septicaemia						1				1			2
2. Malarial Fever													
3. Tuberculosis and Scrofula				2	1		2	1				1	7
4. Syphilis													
5. Cancer		1					1				1	1	4
6. Rheumatism and Gout		1											1
7. Diabetes		1											1
8. Other General Diseases													
9. Alcoholism, Acute and Chronic													
Total		3		2	1	1	3	1		1	1	2	15
Local Diseases.													
III. NERVOUS SYSTEM.													
1. Encephalitis													
2. Simple Meningitis								1					1
3. Epidemic Cerebro-spinal Meningitis		1											1
4. Congestion and Hemorrhage of Brain													
5. Softening of the Brain					1								1
6. Paralysis without specified cause							1				1		2
7. Insanity													
8. Epilepsy							1						1
9. Convulsions (not puerperal)			1		2	1							4
10. Other Nervous Diseases													
Total		1	1		3	1	2	1			1		10

HALIBURTON.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	1	2		1	2		1	2									1								1	1				1				1					1		3
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System		1				1		1														1														1					1
Total	1	3		1	2	1	1	3									1					1			1	1				1				1		1			1		4
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	2	1		2	1		2	1			2															1			1					1						1	3
2. Chronic Bronchitis																																									
3. Broncho-pneumonia																																									
4. Pneumonia																																									
5. Pleurisy																																									
6. Congestion of the Lungs																																									
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	2	1		2	1		2	1			2															1			1					1						1	3
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)																																									
3. Infan. Diarrhoea and Cholera Infantum																																									
4. Diarrhoea and Enteritis (not infantile)																																									
5. Dysentery																																									
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver		1		1				1																	1										1						1
9. Peritonitis (not puerperal)	1				1			1																		1													1		1
10. Iliac Abscess and Appendicitis	1			1				1											1																		1				1
Total	2	1		2	1			3											1						1	1									1		1		1		3
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	1	1		1	1		1	1															1			1				2											2
3. Other Diseases of Kidneys and Adnexa	1			1			1								1														1												1
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	2	1		2	1		2	1							1								1			1			1	2											3

VIII. PUERPERAL DISEASES.																																							
1. Puerperal Septicaemia																																							
2. Puerperal Albuminuria and Convulsions																																							
3. Other Accidents of Pregnancy, sudden death		3		1	2			3								1		1	1								1				1		1						3
4. Puerperal Disease of the Breast																																							
Total		3		1	2			3								1		1	1								1				1		1						3
IX. THE SKIN.																																							
1. Erysipelas																																							
2. Skin and Adnexa (cancer excepted)																																							
Total																																							
X. LOCOMOTOR SYSTEM.																																							
1. Pott's Disease																																							
2. Diseases of the Bones and Joints																																							
3. Amputation (for unspecified Disease)																																							
Total																																							
XI. MALFORMATIONS, ETC.																																							
1. Still-Births	4	1		5			5			5																		2			2	1							5
2. Congen. Debil. and Malformations	1	2		3			2			2																	1	2											3
3. Other Diseases of Infancy																																							
4. Senile Decay	5	2		1	6			6	1																3	4		2	1	2			1				1		7
Total	10	5		9	6		8	6	1	8															3	4	1	6	1	2	2	1	1				1		15
XII. SUICIDE.																																							
1. Poison																																							
2. Strangulation																																							
3. Gas Poisoning																																							
4. Drowning																																							
5. Firearms																																							
Total																																							
XIII. ACCIDENTS.																																							
1. Fractures and Dislocations																																							
2. Gunshot																																							
3. Lightning		1		1				1								1																					1		1
4. Drowning	1				1				1											1													1						1
5. Electric Cars																																							
6. Bicycles																																							
7. Railways																																							
8. Burns and Scalds																																							
9. Homicide																																							
10. Other accidents	1	2		1	2		3	3					1			1		1		1			1		1				1				1		1			1	6
11. Poison	1				1			1											1										1										1
Total	6	3		3	4		3	5	1				1			2		1	1	2			1		1				2				4		1		1	1	9
XIV. ILL-DEFINED CAUSES.																																							
1. Dropsy	1	3		2	2			4												1			1	1		1			1						1		1	1	4
2. Tumors																																							
3. Other Ill-Defined Causes	2	2		3	1			2	2	1														1	1	1		1	1					1				1	4
Total	3	5		5	3			6	2	1										1			1	2	1	2		1	2					1	1		1	2	8
Total from all causes.	43	38		55	25	1	34	40	7	11	3	1	1	5	2	5	5	7	3	3	3	1	5	7	13	6	5	15	7	4	10	5	12	4	4	1	8	6	81

CAUSES OF DEATHS BY COUNTIES IN 1904—HALTON.—(Including municipalities of all classes.)

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Soc'l con. Single.	Soc'l con. Married.	Soc'l con. Not stated.	Ages. Under 5: 0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over.	Not given	Months. Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	2	1		3			3										1					1		1						2						1					
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	2	2		4			4				1			1		1	1												2				1							1	4
7. Influenza	1	1		1	1			2																		1	1				2										2
8. Other Epidemic Diseases																																									
Total	5	4		8	1		7	2			1			1		1	2					1		1		1	1		2	2	2		1			1				1	9
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	1		2	1		1	2															1			1	1		1					1				1			3
2. Malarial Fever	1			1				1														1														1					1
3. Tuberculosis and Scrofula	9	11		20			14	6								1	3	5	3	1	4	1		1	1				1	1	4	3	1	1	3	2	1	2		1	20
4. Syphilis																																									
5. Cancer	3	11		10	4		2	12													2		1	4	3	3	1			1		1	1	2	1	1	2	2	1	2	14
6. Rheumatism and Gout																																									
7. Diabetes	1	1		1	1		1	1										1						1						1						1					2
8. Other General Diseases	4	1		3	2			5												1				1	1	2					1	3		1							5
9. Alcoholism, Acute and Chronic																																									
Total	20	25		37	8		18	27								1	3	6	3	2	6	2	2	7	5	6	2		2	3	5	7	2	5	4	5	3	5	1	3	45
Local Diseases																																									
III. NERVOUS SYSTEM																																									
1. Encephalitis		3		2	1			3														1			1	1					1		1		1						3
2. Simple Meningitis	3	2		5			1	1		1					1	1		1				1								1		1		1			1	1			5
3. Epidemic Cerebro spinal Meningitis																																									
4. Congestion and Hemorrhage of Brain	8	5		8	5			10	3											1				3	3	3	3		1	1		1	2		1		1		5	1	13
5. Softening of the Brain																																									
6. Paralysis without specified cause	5	5		5	4	1	1	8	1							1						1			1	6	1			1	1		1		2		1	1	1	2	10
7. Insanity																																									
8. Epilepsy		1		1				1													1										1										1
9. Convulsions (not puerperal)		5		5			1	1		4													1									1	1		1		1		1		5
10. Other Nervous Diseases	2	1		3				2	1													1		1	1				1			1						1			3
Total	18	22		29	10	1	9	26	5	5					1	2		1		1	1	4	1	4	6	10	1		2	3	3	4	5	1	5		4	3	7	3	40

VI. CIRCULATORY SYSTEM.		
1. Pericarditis		
2. Endocarditis	1 1 1	1
3. Organic Heart Diseases	12 12 13 11 3 21	24
4. Angina Pectoris		
5. Arteries, Atheroma, Aneurism, etc.	1 1 1	1
6. Other Diseases of Circulatory System	1 1 1 1 2	2
Total	15 13 16 11 1 4 24	28
V. RESPIRATORY SYSTEM.		
1. Acute Bronchitis	3 2 4 1 4 1 3	5
2. Chronic Bronchitis	1 1 1 1 2	2
3. Broncho-pneumonia	1 1 1	1
4. Pneumonia	10 6 8 8 4 12 2 1	16
5. Pleurisy	1 1 1	1
6. Congestion of the Lungs, (not pul. apoplexy)	2 2 2 1 1	2
7. Asthma and Emphysema	1 1 1	1
8. Other Diseases of Respiratory System		
Total	17 11 17 11 11 17 6 1 1	28
VI. DIGESTIVE SYSTEM.		
1. Ulcer of the Stomach		
2. Other Dis's. of the Stomach (cancer excepted)		
3. Infant. Diarr. and Cholera Infantum	1 1 1 1 1	
4. Diarrhoea and Enteritis (not infantile)	1 1 1 1 2	2
5. Dysentery		
6. Hernia and Intestinal obstructions	1 3 1 1 3	1
7. Other Diseases of the Intestines		
8. Diseases of the Liver	1 1 1 1 1 2 2	
9. Peritonitis (not puerperal)	1 3 1 1 3	1
10. Iliac Abscess and Appendicitis	2 7 2	7
Total	1 12 20 7 13 12 2 4 1	27
VII. GENITO-URINARY SYSTEM.		
1. Acute Nephritis	1 1 1	1
2. Bright's Disease	1 1 1 1 1 1	1
3. Other Diseases of Kidneys and Adnexa		
4. Vesical Calculi		
5. Diseases of the Bladder		
6. Diseases of the Male Genital Organs	1 1 1	1
7. Metritis		
8. Other Diseases of the Uterus		
9. Ovarian Cysts and other Ovarian Tumors		
10. Other Diseases of the Female Genital Organs		
Total	3 4 5 2 1 6	7
VIII. PUERPERAL DISEASES.		
1. Puerperal Septicaemia		
2. Puerperal Albuminuria and Convulsions		
3. Other Accidents of Pregnancy, sudden death	2 2 2	2
4. Puerperal Disease of the Breast		
Total	2 2 2	2

HALTON.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1			1				1																	1								1								1
2. Skin and Adnexa (cancer excepted)	2			1				2														1			1										2						2
Total	[illegible]			2	1			3																	2								1		2						[illegible]
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints	1				1		1			1																												1			1
3. Amputation for unspecified Diseases																																									
Total	1				1		1			1																												1			1
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	2	2		4			4			4																								1	1			1	1		4
2. Congen. Debil. and Malformations	6	9		15			15			15																					1		5			1		3		1	15
3. Other diseases of Infancy																																									
4. Senile Decay	13	20		8	25		4	29																	1	14	18		5	2	3	1	4	5	2	2	1	3	4	1	33
Total	21	31		27	25		23	29		19															1	14	18		8	5	4	1	7	6	3		1	7	5	2	52
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Other methods		2		2				2													1			1									1	1							2
Total		2		2				[illegible]													1			1									1	1							2
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lighting																																									
4. Drowning	2	2		2	2		3	1							1	1		1						1										1	1	1	1				1
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	5			2	2	1	1	4											1						1										1		1				5
8. Burns and Scalds																																									
9. Homicide																																									
10. Other accidents	3	2		3	1	1	2	3								1							1	1	1		1		1		1			1		1			1		5
11. Poison	1			1			1																	1															1		1
Total	11	4		8	5	2	7	8							1	2		1	1			3	1	3	2		1		1		3			2	5	2	2		2		15
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy		1		1				1																	1								1								1
2. Tumors																																									
3. Other Ill-defined Causes	6	7		10	3		5	7	1			1								1			2	1	2	3	2	1	1	2	2			2	2		1		3		13
Total	6	8		11	3		5	8	1			1								1			2	1	3	3	2	1	1	2	2		1	2	2		1		3		11
Total from all causes	135	138	...	184	85	4	99	166	8	35	3	2	.	1	4	8	9	9	6	10	9	13	10	24	35	49	44	2	27	24	28	19	27	25	26	22	17	18	25	15	273

CAUSES OF DEATHS BY COUNTIES IN 1904.—HASTINGS (Including municipalities of all classes.).

General Diseases.

	Sex: Male	Sex: Female	Sex: Not stated	Nativity: Canada	Nativity: Foreign	Nativity: Not stated	Social Con: Single	Social Con: Married	Social Con: Not stated	Ages (Under 5): 0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months: January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES																																									
1. Typhoid Fever	2	2	.	2	....	2	2	1	1	.										1				1	1	1			1				2				1				4
2. Smallpox		....	.	....	....	...		.	.....																																..
3. Measles			...	..	....																																				
4. Scarlet Fever			...	..	...																																				...
5. Whooping Cough	2	2	...	4		..	4		..	3	1																					1	1	2							4
6. Diphtheria and Croup	10	5	....	15		..	14	1	...	3			3	1	1	3								1						1	1	2	2				1		5	5	15
7. Influenza	3	2	.	2	3	....	3	2	...	1															1	2	1			2		1	2								5
8. Other Epidemic Diseases	..	1	.			1	1		.																			1					1								1
Total	17	12	...	23	3	3	21	4	1	7	1	.	3	1	1	3	.			1	.	.		2	2	3	1	1	1	3	1	4	8	2			2		3	5	29
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia	1	5	...	6		..	1	4	1	1	.							1								1					2	2	.	1		1					6
2. Malarial Fever		1		1	......		1	..	.	.....					1																						1				1
3. Tuberculosis and Scrofula	38	37	.	62	5	3	33	32	5	.		1	.	.	2	.	9	11	10	5	5	7	3	8	3	1		2	7	2	5	3	10	6	7	9	4	:	7	7	70
4. Syphilis																																									.....
5. Cancer	13	17	.	21	9	....	3	26	1	..									1	1	1	..	3	10	7	5	2		2		3	5		2	1	10	3	2	1	1	30
6. Rheumatism and Gout	2	1	.	3	..			3	...	....										1				1		1			.	1					1				1		3
7. Diabetes	5	6	.	10	1	.	5	4	2	....						1	1	2	.	1	1	.		2	2	1		.	2	.		2	1		.	1	1	.	2	2	11
8. Other General Diseases	5	6	....	11	..	...	2	8	1	...							1	1	1	1	.		2	3	.	1	1	.	1		2	..	1	3	1	1	2	.	.		11
9. Alcoholism, Acute and Chronic	1	....	.	1	...				1	..												.	..	1								.	1	.	..	.	.		.		1
Total	60	73	..	115	15	3	45	71	11	1		1	.		.	1	11	15	15	9	7	7	8	25	12	13	3	2	12	3	12	12	13	12	10	22	11	5	11	10	153

Local Diseases.

	Sex: Male	Sex: Female	Sex: Not stated	Nativity: Canada	Nativity: Foreign	Nativity: Not stated	Social Con: Single	Social Con: Married	Social Con: Not stated	Ages (Under 5): 0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months: January	February	March	April	May	June	July	August	September	October	November	December	Totals
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1	3		4	.....		3	1	..	2														.	1	.		1	.	1											4
2. Simple Meningitis	10	1	.	13	...	1	11	2	1	1	1	1			1	1	2	.	2	.	.	1	.			1	.	.	2	.	4		2			.	1		2	..	11
3. Epidemic Cerebro-spinal Meningitis	1	1	.	2	.	.	1	1	.	1														.	1											.	1	.	1	.	2
4. Congestion and Hemorrhage of Brain	12	13	.	19	5	1	3	19	3	....							..	.		1	.	1	1	4	7	8	2	1	6	1	1	1	1		..	3	1	3	1	1	25
5. Softening of the Brain	1	..	.	..	1	...	....	1	.	....																	1		1												1
6. Paralysis without specified cause	8	10	..	9	9	...	.	14	4	..													.	3	3	8	4		1	2		1	1	1	1	2	1	3	1	1	18
7. Insanity	1	.	.		..	1	..	1	....	...													.	1					..						1	.			..		1
8. Epilepsy		1	...	1	....	..	1	.....	....	...										.	1	.	.													.	1	.	.	.	1
9. Convulsions (not puerperal)	11	4	.	15	.		15		...	15																			1	1	2	1	2	1	3	.	2	1	.	1	15
10. Other Nervous Diseases	3	3	....	6	.....	....	1	5		...						1			..	1	.	.	1	1	2	.			1		2	.		.	1		1	.	..	1	6
Total	48	39	..	69	15	3	35	44	8	22	1	1	.		1	2	2		2	2	1	2	2	9	14	17	7	2	12	5	12	6	12	2	6	5	8	7	5	7	87

HASTINGS.—*Continued.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis	1			1				1																		1														1	1
3. Organic Heart Diseases	25	17		26	16		4	31	7								1		1	1		1		4	13	17	4		1	4	5	6	7	3	1	5	3	4	3	2	42
4. Angina Pectoris	1			1				1																		1														1	1
5. Arteries, Atheroma, Aneurism, etc.	1					1	1																			1						1									1
6. Other Diseases of Circulatory System	1	1		1	1			2																2										1						1	2
Total	29	18		29	17	1	5	35	7								1		1	1		1		6	13	20	4		1	4	5	7	7	4	1	5	3	4	3	5	47
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	8	5		11	2		8	1	1	5	1					1								1	1	3	1			1	5		3						3	1	13
2. Chronic Bronchitis	2			2				1	1																1	1			1										1		2
3. Broncho-pneumonia	2	2		2	2			1																	1	2	1			2	1				1						4
4. Pneumonia	28	25		39	10	1	21	26	6	10	4		1			1		3	2	2	2	2	1	5	7	5	5	1	4	10	5	4	5	6	4		2	2	3	8	53
5. Pleurisy		2		2			1	1						1													1		1				1								2
6. Congestion of the Lungs	6	2		7	1		6	1	1	1	1	2		1						1			1		1				1		2	1					1		1	2	8
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	46	36		63	15	4	36	37	9	16	6	2	1	2		2	2	3	2	3	2	2	2	6	11	11	8	1	7	13	13	5	9	6	5		3	2	8	11	82
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the Stomach	1	1		2				1	1															2					1									1			2
2. Other Diseases of Stomach (cancer excepted)	7	6		12	1		5	7	1													2		2	2	2	2		2	1	1	1				2		2	1	3	13
3. Infantile Diarrhœa and Cholera Infantum	13	10		23			25			17	2		2	2																	2	1	1	3	3	5	6		1	1	23
4. Diarrhœa and Enteritis (not infantile)	2	4		4	2		1	1	1									1					1			4				1	1			1	1		1	1			6
5. Dysentery	2	1		1	1	1		2	1															1	1		1		1							1	1				3
6. Hernia and Intestinal obstructions	2	1		2	1		1	1	1	2																	1		1			1				1					3
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	4	3		5	2		2	1	1	1											1				4		1			1	1			2		1	1	1			7
9. Peritonitis (not Puerperal)	1	1		2			1	1											1					1					1	1											2
10. Iliac Abscess and Appendicitis	3			3				1	2												2			1							1			1	1						2
Total	35	27		54	7	1	33	21	8	23	2		2	2				1	1		3	2	1	7	7	6	5		6	4	6	3	1	7	5	10	9	5	2	1	62
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	2	3		3	2		1	2	2														1	2	1	1						1	2		1					1	5
2. Bright's Disease	10	3		10	2	1		11	2										1		1	4		1	1	4	1		1	1				2	1	2		2		1	13
3. Other Diseases of Kidneys and Adnexa	1	1		2			2													1					1									1						1	2
4. Vesical Calculi																																									
5. Diseases of the Bladder	1			1				1																		1						1									1
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the female Genital Organs		2		1	1			2												1		1																1		1	2
Total	14	9		17	5	1	3	16	4										1	2	1	5	1	3	3	6	1		1	1		2	2	3	2	2		3		7	23

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		2		2				2											2										1			1									2
2. Puerperal Albuminuria and Convulsions																																									
3. Other accidents of Pregnancy, sudden death		2		2				2										1	1													1					1				2
4. Puerperal Disease of the Breast																																									
Total		4		4				4										1	3										1			2					1				4
IX. THE SKIN.																																									
1. Erysipelas	1	2		2	1			3													1				1	1						1	1							1	3
2. Skin and Adnexa (cancer excepted)		2		2			2			2																											1		1		2
Total	1	4		4	1		2	3		2											1				1	1						1	1				1		1	1	5
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-births	11	10		21			21			21																			1	1	2	3	2		1	2		1	3	2	21
2. Congen. Debility and Malformations	22	22		44			44			44																			6	3	2	2	2	3	4	2	5	9	2	4	44
3. Other Diseases of Infancy	3	2		5	1		5			2	1	1			1														1				1		2					1	5
4. Senile decay	62	47		41	65	3	7	88	11																3	17	58	1	10	21	9	8	10	4	8	4	9	7	5	14	109
Total	98	81		110	66	3	77	88	11	67	1	1			1										5	17	58	1	18	28	13	13	15	7	15	8	14	17	10	21	179
XII. SUICIDE.																																									
1. Poison	1			1				1												1																		1			1
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning	1			1			1										1																		1						1
5. Firearms		1		1			1											1																	1						1
6. Not stated		1		1				1															1									1									1
Total	2	2		4			2	2									1	1		1			1									1			2			1			4
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot				1	1		2										1	1																			1			1	2
3. Lightning	1			1				1																	1								1								1
4. Drowning	7			3	3	1	3	2	2							2	1			3					1						1		1		1			2	2		7
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	1			1			1											1																				1			1
8. Burns and Scalds	1	3		4			4					2			2															1		1	1					1			4
9. Homicide																																									
10. Other accidents	14	4		14	3	1	9	6	3	2				1	1	1	1	2	1		1	1	2	1	1	2	1		3	2	1	1		2	2	2	1	1	2	1	18
Total	26	7		24	7	2	19	9	5	2		2		1	3	3	3	4	1	3	1	1	2	1	3	2	1		3	3	2	2	3	2	3	2	2	5	4	2	33
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	5	10		12	3		3	12									1					1	1	4	2		5	1	5	1					1		2	2		4	15
2. Tumors	2	1		3				3																1	2						2				1						3
3. Other Ill defined Causes	11	11		20	2		9	11	2	2		1					3		1	1	2	4	1	2	3	2			2	1	3	2	1	1	1	3	1	2	2	2	22
Total	18	22		35	5		12	25	2	2		1					1		1	1	2	5	2	7	7	2	5	1	8	2	5	2	1	1	3	3	3	4	2	6	40
Total from all causes	394	334		551	156	21	293	363	72	142	11	8	6	6	12	11	24	25	27	23	18	25	19	66	76	128	93	8	70	66	69	60	72	46	52	55	57	53	49	79	728

CAUSES OF DEATHS BY COUNTIES IN 1904.—HURON—(Including municipalities of all classes).

General Diseases.	Sex. Male	Sex. Female	Sex. Not stated	Nativity. Canada	Nativity. Foreign	Nativity. Not stated	Social Condition. Single	Social Condition. Married	Social Condition. Not stated	Ages. Under 5. 0-1	Under 5. 1	Under 5. 2	Under 5. 3	Under 5. 4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months. January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	5	2		7			4	3										2	1	1	2		1										3				2	1	1		7
2. Smallpox																																									
3. Measles	1	1		2			2			2																								1				1			2
4. Scarlet Fever		1		1			1										1																					1			1
5. Whooping Cough	3	2		5			5			4	1																		1							1		2		1	5
6. Diphtheria and Croup	5	1		5	1		5	1		1		1			1	1			1							1			2		3								1		6
7. Influenza	3	4		4	3		1	6		1					1					1					1	2	1		3	3								1			7
8. Other Epidemic Diseases	2			2			2					1			1														2												2
Total	19	13		26	4		20	10		8	1	2			3	1	1	2	2	2	2		1		1	3	1		8	3	3		3	1		1	2	6	2	1	30
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicæmia	1	1		2				2											1					1									1		1						2
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	29	29		48	8	2	37	21		2	2						1	5	8	14	4	3	2	6	8				3	1	6	5	7	6	6	3	7	2	7	2	58
4. Syphilis																																									
5. Cancer	18	21		19	23		3	39										1					2	9	13	9	8		5	5	1	1	7	3	3	2	4	6	2	3	42
6. Rheumatism and Gout	2	1		2	1		2	1									1				1					1						2	1								3
7. Diabetes	2	3		2	3		1	4										1			1			1	1	1			1	1	1					1			1		5
8. Other General Diseases	9	7		9	6	1	1	14	1	1								1		2		2	1	2	2	5			1		2	3	3	1	2	1		1		2	16
9. Alcoholism, Acute and Chronic																																									
Total	61	65		82	41	3	41	81	1	3	2						5	8	9	16	6	5	5	19	24	16	8		10	10	10	11	19	10	12	7	11	9	10	7	126
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	5	2		7			5	1	1	2					1	1	1			1	1								1	1		1	1				1		1	1	7
2. Simple Meningitis	4	6		9	1		6	4			2				3					2	2	1								1	1		2	1		1	3	1			10
3. Epidemic Cerebro-spinal Meningitis		1		1			1									1																	1								1
4. Congestion and Hemorrhage of the Brain	15	14		14	15		2	27				1											1	3	6	14	4		2	1	1	1	4	4	6	3	2		3	2	29
5. Softening of the Brain	1	2			3			3																1	2						1	1			1						3
6. Paralysis without specified cause	11	10		9	12		2	19										1					1		4	12	3		1	2	5		1	1	3		3		2	3	21
7. Insanity	2			1	1		1	1										1								1											2				2
8. Epilepsy	3			2	1		2	1		1							1							1									1					1	1		3
9. Convulsions (not puerperal)	5	5		10			10			7	2	1																		1	1	2		1			2	1	1	1	10
10. Other Nervous Diseases	5	2		2	5		4	3							1	1									2	2	1			1	1	1		1				2	1		7
Total	51	42		55	38		33	59	1	10	4	2			5	3	2	2		3	3	1	2	5	14	29	8		4	7	10	6	10	8	10	4	13	5	9	7	93

IV. CIRCULATORY SYSTEM.											
1. Pericarditis	....	....	....	....	....	....	....	....	....	....	
2. Endocarditis	....	2	....	1	1	....	1	1	....	1 1 1 1	2
3. Organic Heart Diseases	26	24	....	21	29	....	7	13	....	1 2 2 2 2 6 10 16 9 5 4 5 7 3 5 5 2 3 5 2 4	50
4. Angina Pectoris	1	1	....	1	1	....	1	1	....	1 1 1 1	2
5. Disease of Arteries, Atheroma, Aneurism, etc	3	....	....	....	3	....	2	1	....	1 1 1 1 2	3
6. Other Diseases of the Circulatory System	1	5	..	4	2	..	1	5	....	6 1 1 1 1 2	6
Total	31	32	....	27	36	....	12	51	....	1 3 2 1 2 2 13 13 16 10 5 6 5 8 5 6 6 3 4 5 2 8	63
V. RESPIRATORY SYSTEM											
1. Acute Bronchitis	8	8	...	8	8	....	7	9	....	6 1 2 2 5 2 2 1 1 2 1 2 1 2 2	16
2. Chronic Bronchitis	....	1	....	1	....	....	1	....	..	1 1	1
3. Broncho-pneumonia	2	8	....	6	4	....	6	4	...	3 2 1 1 3 1 2 1 1 1 1 2	10
4. Pneumonia	22	27	...	29	20	...	12	37	...	6 1 1 1 1 1 1 1 3 3 5 6 11 8 4 10 9 8 5 2 1 1 1 1 4 3	49
5. Pleurisy	2	....	..	...	2	....	1	1	....	1 1 2	2
6. Congestion of the Lungs (incl. pul. apoplexy)	2	2	...	1	....	...	4	....	...	1 1 1 1 1 1 2	4
7. Asthma and Emphysema	....	1	....	1	....	...	....	1	....	1 1	1
8. Other Diseases of the Respiratory System	....	....	..	....	....	...	....	....	....	....	
Total	36	47	....	19	34	....	31	52	....	17 3 1 2 1 1 1 3 1 1 1 3 5 9 15 16 11 12 10 11 7 6 3 3 2 5 6 7	83
VI. DIGESTIVE SYSTEM											
1. Ulcer of the Stomach	1	....	...	...	1	....	....	1	...	1 1	1
2. Other Dis's. of the Stomach (cancer excepted)	3	3	....	2	1	....	1	5	....	1 1 1 1 2 1 1 1 1 2	6
3. Infan. Diarr. and Cholera Infantum	4	2	....	6	....	....	6	....	....	6 1 1 1 2 1	6
4. Diarrhœa and Enteritis (not infantile)	3	2	....	3	1	1	1	3	1	1 1 2 1 1 2 1 1	5
5. Dysentery	...	...	...	...	...	...	...	...	...	....	....
6. Hernia and Intestinal obstructions	2	2	..	2	2	....	2	2	..	1 2 1 1 1 1 1	4
7. Other Diseases of the Intestines	1	..	....	1	..	....	1	....	....	1 1	1
8. Diseases of the Liver	3	2	...	3	2	....	...	5	....	1 2 2 1 1 1 1 1	5
9. Peritonitis (not puerperal)	4	4	...	3	4	1	2	6	...	1 2 1 3 1 1 2 1 1 1 1 1	8
10. Iliac Abscess and Appendicitis	1	4	...	6	2	..	3	5	..	1 2 2 2 1 1 1 1 1 1 1 1 1	8
Total	25	19	...	26	16	2	16	27	1	8 1 2 2 2 1 3 1 6 7 10 1 3 3 5 4 3 2 6 2 7 1 2 3	44
VII. GENITO-URINARY SYSTEM											
1. Acute Nephritis	2	1	....	3	....	....	3	....	....	1 1 1 1 2	3
2. Bright's Disease	4	2	....	4	2	..	3	3	...	1 1 1 2 1 1 2 1 1 1	6
3. Other Diseases of the Kidneys and Adnexa	2	1	...	3	3	..	...	6	...	1 3 1 1 2 1 1 1 1	6
4. Vesical Calculi	...	....	..	...	....	....	....	....	...	....	....
5. Diseases of the Bladder	5	3	..	2	6	....	....	7	1	1 1 2 1 1 1 1 2 1 2	8
6. Diseases of the Male Genital Organs	1	..	..	...	1	....	...	1	....	1 1	1
7. Metritis	..	....	...	....	....	....	....	....	....	....	
8. Other Diseases of the Uterus	..	....	...	....	....	....	....	....	....	....	
9. Ovarian Cysts and other Ovarian Tumors	....	....	....	...	....	....	....	....	....	....	
10. Other Diseases of the Female Genital Organs	....	....	....	...	....	....	....	....	....	....	....
Total	14	10	....	12	12	..	6	17	1	1 1 1 2 2 6 7 2 2 3 2 2 2 3 1 2 3 3 3	24
VIII. PUERPERAL DISEASES											
1. Puerperal Septicaemia	..	1	....	1	....	....	.	1	....	1 1	1
2. Puerperal Albuminuria and Convulsions	...	....	..	...	....	....	..	....	....	....	.....
3. Other accidents of Pregnancy, sudden death	....	5	..	4	1	...	...	5	..	2 3 1 1 1 1 1	5
4. Puerperal Disease of the Breast	..	....	..	...	....	....	....	....	....	....	......
Total	....	6	....	5	1	....	....	6	....	3 3 1 1 1 1 1 1	6

HURON. *Concluded*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas		1		1				1																			1									1					1
2. Other Dis. of Skin and Adnexa (cancer except.)																																									
Total		1		1				1																			1									1					1
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints	1			1				1												1																	1				1
3. Amputation (for unspecified Dis.)																																									
Total	1			1				1												1																	1				1
XI. MALFORMATIONS, ETC.																																									
1. Still Births	16	7		23			23			23																			1	2			5	2	3	5		3		2	23
2. Congen. Debility and Malformations	26	23		49			49			49																			6	1	1	6	2	3	6	3	9	5	3	4	49
3. Other Diseases of Infancy		1		1			1			1																			1												1
4. Senile Decay	62	48		8	102		10	98	2																1	37	72		11	18	8	7	7	8	6	4	8	10	5	18	110
Total	101	79		81	102		83	98	2	73															1	37	72		19	21	9	13	14	13	15	12	17	18	8	24	183
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENTS																																									
1. Fractures and Dislocations		1			1			1																			1			1											1
2. Gunshot																																									
3. Lightning	2	1		3			2	1									2									1									2	1					3
4. Drowning	1	1		2				1	1									1				1														2					2
5. Electric Cars																																									
6. Railways	2	1		2	1			3										1								2							2			1					3
7. Burns and Scalds	1			1				1														1															1				1
8. Other Accidents	9			6	3		6	3					1			1		2	2	1				1	1						2			1		1		1	2	2	9
9. Poison		1		1			1										1																	1							1
Total	15	5		15	5		9	10	1				1			1	3	4	2	1		2		1	1	3	1			1	2		2	2	2	5	1	1	2	2	20
XIV. ILL-DEFINED CAUSES																																									
1. Dropsy	3	6		6	3		1	8							1								1	2	2	3				1		2	1	1	2	1			1		9
2. Tumors	4	3		4	3		3	1								1					1	1			2	1	1				1			1	1		3		1		7
3. Other Ill-Defined Causes	5	4		8	1		5	4								2	1		1					1	2	1		1		1			3	1	1			1		2	9
4. Heart Failure	4	5		6	2	1	1	8									1		1		2	1		1	2		1			1	1		1			2		1	2	1	9
5. Tetanus	1	1		2			2									1						1												1				1			2
Total	17	19		26	9	1	12	24							1	4	2		2		3	3	1	4	8	5	2	1		3	2	2	5	4	4	3	3	3	4	3	36
Total from all causes	374	336		406	298	6	266	437	7	119	11	5	3		11	9	17	23	23	29	18	22	15	55	84	141	122	3	64	68	59	58	72	53	59	41	63	59	48	66	710

CAUSES OF DEATHS BY COUNTIES IN 1904.—KENT.—(Including municipalities of all classes).

General Diseases.	Sex.			Nativity.			Soc'l con.			Ages. Under 5																			Months												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0,	1,	2,	3	4.	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over	Not given	January	February	March.	April.	May.	June	July.	August.	Sept.	Oct	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I COMMUNICABLE DISEASES																																									
1. Typhoid Fever	6	9		12	2	1	6	6	3	1	1				2		2		1		3	2	1	1	1				1				1			1	1	2	4	5	15
2 Smallpox																																									
3 Measles	1			1			1			1																													1		1
4 Scarlet Fever		2		1		1	2				1				1																			1						1	2
5. Whooping Cough	3	2		5			5			2	3																			1	1	1					2				5
6 Diphtheria and Croup	4	8		12			11	1		2		1	1		6	1				1									4		1		1			1	1	1	2	1	12
7 Influenza	2	5		6	1		3	4		3												1			1		2		2	2	2							1			7
8 Other Epidemic Diseases.																																									
Total	16	26		37	3	2	28	11	3	9	5	1	1		9	1	2		1	1	3	3	1	1	2		2		7	3	4	1	2	1		2	1	4	7	7	42
II OTHER GENERAL DISEASES																																									
1 Pyaemia and Septicaemia	3	2		1	1		2	2	1	1									2			1	1												1		1			3	5
2 Malarial Fever																																									
3 Tuberculosis and Scrofula	51	56		54	12	1	25	39	3	1						2	5	10	5	9	7	9	2	10	3	4			7	6	6	5	7	4	6	6	4	8	1	7	67
4 Syphilis																																									
5 Cancer	12	19		19	10	2	3	24	4													3	3	4	12	2	5	2	2	1	1	3	1	6	2	6	4	2	2	1	31
6 Rheumatism and Gout	2	1		2	1			3														1			1	1				1			1			1					3
7 Diabetes	5	4		8	1		4	1	1	1					1	2			1		1				1	1	1		2	2		1		1	1		1			1	9
8 Other General Diseases	1	8		7	2		1	8												1			1	2	1	1			1	2	2			1		1		2			9
9 Alcoholism, Acute and Chronic																																									
Total	54	70		94	27	3	33	80	11	3					1	4	5	10	8	13	8	14	7	16	18	9	6	2	12	12	9	9	9	12	10	14	10	12	3	12	124
Local Diseases.																																									
III NERVOUS SYSTEM																																									
1 Encephalitis	6	6		10	2		8	3	1	3			1			2	2		1		1				1	1			2		2	1	1				1	2	1	2	12
2 Simple Meningitis	5	5		9	1		9		1	3	2	1			1		2									1			2		1	2	1		2	1				1	10
3 Epidemic Cerebro-spinal Meningitis																																									
4 Congestion and Hemorrhage of the Brain	19	3		13	8	1		19	3													1		5	7	3	6				3				2	2	3	3	3	3	22
5. Softening of the Brain	2				2			2																		1	1		1						1						2
6 Paralysis without specified cause	13	13		19	7		7	16	3			1				1		1	1			2	1	1	7	10	1		1	5	4	2	2	2	2	1	3			1	26
7 Insanity	1			1				1																	1									1							1
8 Epilepsy																																									
9. Convulsions (not puerperal)	8	3		10	1		10	1		9	1															1			3	1		3		1	1		2				11
10. Other Nervous Diseases	4	3		6	1			5	2												1	1	3		1	1				1	3		1						1	1	7
Total	68	33		68	22	1	54	47	10	15	3	2	1		1	3	4	1	2		2	4	4	6	17	18	8		9	7	13	8	5	7	8	4	9	5	5	11	91

KENT.—*Continued.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IV. CIRCULATORY SYSTEM																				
1. Pericarditis																				
2. Endocarditis	27	19		28	18		7	35	4						2		1		3	
3. Organic Heart Disease	1	1			2		1	1									1			
4. Angina Pectoris	1	2		2	1		1	2												
5. Arteries, Atheroma, Aneurism, etc.																				
6. Other Diseases of the Circulatory System																				
Total	29	22		30	21		9	38	4						2		2		3	
V. RESPIRATORY SYSTEM																				
1. Acute Bronchitis	6	2		6	2		1	5	1	3			1				1			
2. Chronic Bronchitis																				
3. Broncho-pneumonia	2	3		2	3		1	1			1									
4. Pneumonia	20	11		27	6	1	21	11	2	6	2	2				1	5	1	1	1
5. Pleurisy	2	1		2	1		1	2			1									
6. Congestion of the Lungs (inc. pul. apoplexy)	1	3		6	1		5	2		3	2									
7. Asthma and Emphysema	3	1		2	2		2	2			1									
8. Other Diseases of the Respiratory System																				
Total	37	24		45	15	1	34	24	3	12	7	2	1			1	1	1	1	1
VI. DIGESTIVE SYSTEM																				
1. Ulcer of the stomach																				
2. Other Diseases of stomach (cancer excepted)	1	3		5	2		1	5	3		1									
3. Infantile Diarrhœa and Cholera Infantum	12	2		14			14			11	3									
4. Diarrhœa and Enteritis (not infantile)	1	2		2	1			3												
5. Dysentery	1	1		2				1	1											
6. Hernia and Intestinal obstructions	5	2		3	3	1	1	3	3											
7. Other Diseases of the Intestines	2	2		3	1			1											1	
8. Diseases of the Liver	4	7		9	2		4	7									1	1		
9. Peritonitis (not puerperal)	1	7		8			3	4	1						1	2				1
10. Iliac Abscess and Appendicitis	2	3		5			3	2							2		1			
Total	32	29		52	8	1	26	27	8	11	4				3	2	2	1	1	1
VII. GENITO-URINARY SYSTEM																				
1. Acute Nephritis	2	3		5				5											1	
2. Bright's Disease	1	5		7	2		2	6	1										1	
3. Other Diseases of Kidneys and Adnexa	2				2		1	1												
4. Vesical Calculi																				
5. Diseases of the Bladder		1		1				1												
6. Diseases of the Male Genital Organs	1				1			1												
7. Metritis																				
8. Other Diseases of the Uterus																				
9. Ovarian Cysts and other Ovarian Tumors		1			1			1											1	
10. Other Diseases of the Female Genital Organs		1		1					1											
Total	9	11		14	6		3	15	2										3	

Number of Column	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																					
1. Pericarditis																					
2. Endocarditis		2	1	5	14	15	3		1	7	6	1	4	3	5	4	7	4	3	3	16
3. Organic Heart Disease					1							1	1								2
4. Angina Pectoris					1	1		1		1				1						1	3
5. Arteries, Atheroma, Aneurism, etc.																					
6. Other Diseases of the Circulatory System																					
Total		2	1	5	16	16	3	1	1	8	6	2	5	4	3	1	7	4	3	4	51
V. RESPIRATORY SYSTEM																					
1. Acute Bronchitis				1	1	1			1	1	3			1	1					1	8
2. Chronic Bronchitis																					
3. Broncho-pneumonia				1	2		1		1		1		1	1			1				5
4. Pneumonia	2	3		2	1	6	2	1	8	6		1	5	5		4		2	2	3	34
5. Pleurisy					1	1			2			1									3
6. Congestion of the Lungs (inc. pul. apoplexy)		1				1					3	1		1			1		1		7
7. Asthma and Emphysema				1	1	1					2	2									4
8. Other Diseases of the Respiratory System																					
Total	2	3		5	6	10	3	1	12	7	9	5	6	6	1	4	2	2	3	4	61
VI. DIGESTIVE SYSTEM																					
1. Ulcer of the stomach																					
2. Other Diseases of stomach (cancer excepted)		1		2	1	2					1	2				1	2			1	7
3. Infantile Diarrhœa and Cholera Infantum											1					5	5	2	1		14
4. Diarrhœa and Enteritis (not infantile)						2	1			1	2										3
5. Dysentery						1	1										1	1			2
6. Hernia and Intestinal obstructions		1			3	1	2			1		1							5		7
7. Other Diseases of the Intestines		1			1		1			1					2					1	4
8. Diseases of the Liver	1	1		2	2		2	1					2	1	2	2	1	2		1	11
9. Peritonitis (not puerperal)		1				2		1	1	1	2	1		1		1	1				8
10. Iliac Abscess and Appendicitis	1					1						1				1	1	1		1	5
Total	2	5		4	7	9	7	2	1	4	6	5	2	2	1	10	11	6	6	4	61
VII. GENITO-URINARY SYSTEM																					
1. Acute Nephritis					2	1	1			1	2	1								1	5
2. Bright's Disease	2			1	2	2	1		1		2	1	1						1	3	9
3. Other Diseases of Kidneys and Adnexa						1	1					1	1								2
4. Vesical Calculi																					
5. Diseases of the Bladder	1												1								1
6. Diseases of the Male Genital Organs						1			1												1
7. Metritis																					
8. Other Diseases of the Uterus																					
9. Ovarian Cysts and other Ovarian Tumors															1						1
10. Other Diseases of the Female Genital Organs			1								1										1
Total		3	1	1	4	5	3		2	1	5	3	3		1				1	4	20

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		1		1				1														1															1				1
2. Puerperal Albuminuria and Convulsions		2		2				2										1		1										2											2
3. Other Accidents of Pregnancy, sudden death		1		1				1														1												1							1
4. Puerperal Diseases of the Breast																																									
Total		4		4				4										1		1		2								2				1			1				4
IX. THE SKIN																																									
1. Erysipelas	1	1		2			2			1							1																					1		1	[illegible]
2. Skin and Adnexa (cancer excepted)																																									
Total	1	1		2			2			1							1																					1		1	2
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints	1			1			1										1																						1		1
3. Amputation (for unspecified disease)																																									
Total	1			1			1										1																						1		1
XI. MALFORMATIONS, ETC.																																									
1. Still Births	20	18	1	39			39			39																			1	3	3	3	3	1	3	7	4	5	1	5	39
2. Congen. Debility and Malformation	38	33	3	74			74			74																			6	5	4	5	6	7	9	6	5	5	10	6	74
3. Other Diseases of Infancy	2	2		4			1			3	1																								1	1	1			1	4
4. Senile Decay	51	58		34	54	4	1	78	13																	30	62		1	6	12	9	9	5	6	4	4	10	8	18	92
Total	114	91	4	151	54	4	118	78	13	116	1															30	62		8	14	19	17	18	13	19	18	14	20	19	30	209
XII. SUICIDE																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms	1			1			1										1														1										1
6. Not stated	2			1		1		1	1															1	1				1											1	2
Total	3			2		1	1	1	1								1							1	1				1		1									1	3
XIII. ACCIDENT.																																									
1. Fractures and Dislocations	3	1		1	3			2	2														1		1		2		1		1				1			1			4
2. Gun-shot	3			3			3										2											1	1			2									
3. Lightning																																									
4. Drowning	7	2		5	4		5		1		1	1		2				2	1	1			1								2	1	1	2	1		1			1	9
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	2				1	1	1		1						1													1					1					1			2
8. Burns and Scalds	3	1		3	1		2	2		1	1												1		1						1					1			1	1	4
9. Homicide																																									
10. Other Accidents	6	4		6	3	1	6	2	2	4							1			1						1					2		1	3	1				2	1	10
Total	24	8		18	12	2	17	6	9	5	2	1		2	1		3	2	1	2			3		5	1	2	2	2		6	3	7	[illegible]	3	1	1	2	3	3	32
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	7	4		6	3	2		8	3															2	1	4	1		3	4					1	1				2	11
2. Tumors	4	5		6	2	1		9													1	1		1	2	4				1	1	1	3		1					2	9
3. Other Ill Defined Causes	3	6		7	2		2	7		1									1	1	2	1		1		1		1	1		1		1	1	1	1	1		1	1	9
4. Heart Failure	1	6		6	3	1	1	7	2										1	1	2	1		3	1	1			1			2	1	1			1	1	3		10
5. Tetanus	1	1		2			2							1			1																			1				1	2
Total	19	22		27	10	4	5	31	5	1				1			1		2	2	5	3		7	1	10	4	1	5	5	2	3	5	2	3	3	2	1	4	6	41
Total from all Causes	397	341	4	545	178	19	311	362	69	173	22	6	3	3	17	11	26	16	22	21	25	37	17	46	80	108	100	9	60	63	80	56	58	53	52	60	61	57	55	87	742

CAUSES OF DEATHS BY COUNTIES IN 1904—LAMBTON. (Including municipalities of all classes.)

General Diseases.	Sex: Male	Sex: Female	Sex: Not stated	Nativity: Canada	Nativity: Foreign	Nativity: Not stated	Social Conditions: Single	Social Conditions: Married	Social Conditions: Not stated	Ages: Under 1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months: January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	4	6		9	1		7	3						1	1		1		1	2		2		1				1				1	1	1		3		2	1	1	10
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	1	1		2			2				1		1																1									1			2
5. Whooping Cough	1	1		2			2			1	1																				1			1							2
6. Diphtheria and Croup	4	1		5			5					2	1			2														1	1	1			1	1					5
7. Influenza	1	2		1	1	1		3																		2	1		1	1	1										3
8. Other Epidemic Diseases																																									
Total	11	11		19	2	1	16	6		1	2	2	2	1	1	2	1		1	2		2		1		2	1	1	2	2	3	2	1	2	1	4		3	1	1	22
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	9	5		9	5		3	11		1								1	2	1	1	1		4		3			1	1	2	4	3					2			14
2. Malarial Fever	1				1			1																		1													1		1
3. Tuberculosis and Scrofula	32	51		73	10		40	43			1				1	5	11	13	8	11	8	3	4	6	2	7	4		6	10	10	8	7	11	6	1	9	2	5	8	83
4. Syphilis																																									
5. Cancer	16	11		15	12		3	24										1				3	2	1	12	2	5	1	2	1	1	3	2		3	1	3	1	2	2	27
6. Rheumatism and Gout	4	1		5	2	1	4	4									2	1		1				1	2	1			1	1			2				1	2		1	8
7. Diabetes	6	1		7			3	4							1		2						1	3					1	1			1	2					1	1	7
8. Other General Diseases	1	1		1	1		1	1									1					1			2	1					1				1	2			1		5
9. Alcoholism, Acute and Chronic	2			1	1		1	1										1							1						1		1								2
Total	74	73		114	32	1	55	92		1	1				2	5	16	17	10	13	9	10	7	15	19	15	6	1	11	14	15	15	16	13	10	7	13	11	10	12	147
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis		2		2				2													1					1									1				1		2
2. Simple Meningitis	6	1		6	1		5	2		3	1					1					2								1		1			2		1	1	1			7
3. Epidemic Cerebro-spinal Meningitis	1	5		6			3	3				1			1						1				2						1		1				1	3			6
4. Congestion and Hemorrhage of the Brain	17	12		13	16			29													1	1	1	3	5	12	6		2	1	2	3	3		1	2	2	7	1	2	29
5. Softening of the Brain	1	2		2	1			3																	2		1					2						1			3
6. Paralysis without specified cause	13	10		9	14		1	22								1						1	1	3	3	6	8		3	3		5	3	2	2			2	2	1	23
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	11	3		14			14			11				1		2													2	1					1	2	1	1	2	1	14
10. Other Nervous Diseases	1	4		5			2	3									1						2	2					1							2		2			5
Total	50	39		57	32		25	64		15	1	1		1	1	4	1				5	2	4	8	12	19	15		9	5	4	10	7	4	5	7	5	20	9	4	89

IV. CIRCULATORY SYSTEM.												
1. Pericarditis	...	...	...	...	...	...	...	...	...	...	[illegible]	...
2. Endocarditis	1	1	...	1	1	...	1	1	...	1	[illegible]	2
3. Organic Heart Diseases	21	17	...	21	15	2	6	31	1	...	[illegible]	38
4. Angina Pectoris	...	...	...	...	...	...	...	...	...	...	[illegible]	...
5. Arteries, Atheroma, Aneurism, etc	5	1	...	1	2	...	...	6	...	...	[illegible]	...
6. Other Diseases of Circulatory System	...	...	...	...	...	...	...	...	...	...	[illegible]	6
Total	27	19	...	26	18	2	7	38	1	1	[illegible]	46
V. RESPIRATORY SYSTEM												
1. Acute Bronchitis	2	8	...	8	1	1	6	4	...	6	[illegible]	10
2. Chronic Bronchitis	1	...	...	...	1	...	...	1	...	...	[illegible]	1
3. Broncho-pneumonia	4	2	...	5	1	...	4	2	...	3	[illegible]	6
4. Pneumonia	19	19	...	26	10	2	15	23	...	3	[illegible]	38
5. Pleurisy	2	3	...	4	1	...	2	3	...	...	[illegible]	5
6. Congestion of the Lungs (inc. pul. apoplexy)	5	2	...	5	1	1	4	3	...	1	[illegible]	7
7. Asthma and Emphysema	...	2	...	1	1	...	...	2	...	...	[illegible]	2
8. Other Diseases of Respiratory System	...	...	...	...	...	...	...	...	...	...	[illegible]	...
Total	[illegible]	36	...	49	16	4	31	38	...	13	[illegible]	69
VI. DIGESTIVE SYSTEM												
1. Ulcer of the Stomach	2	...	...	2	...	...	...	2	...	...	[illegible]	2
2. Other Diseases of Stomach (cancer excepted)	2	3	...	2	3	...	1	4	...	...	[illegible]	5
3. Infant. Diarr. and Gastro Ent. (cholera infant.)	5	11	1	17	...	...	17	...	...	15	[illegible]	17
4. Diarrhœa and Enteritis (not infantile)	3	5	...	2	6	...	3	5	...	...	[illegible]	8
5. Dysentery	...	1	...	...	1	...	...	1	...	...	[illegible]	1
6. Hernia and Intestinal obstructions	1	3	...	3	1	...	2	2	...	...	[illegible]	1
7. Other Diseases of the Intestines	1	...	...	...	1	...	1	...	...	...	[illegible]	1
8. Diseases of the Liver	2	6	...	3	5	...	2	6	...	...	[illegible]	5
9. Peritonitis (not puerperal)	1	8	...	8	1	...	4	5	...	...	[illegible]	9
10. Iliac Abscess, Typhlitis, Perityphlitis Appendi	3	4	...	7	...	...	5	2	...	...	[illegible]	7
Total	20	41	1	44	18	...	35	27	...	15	[illegible]	62
VII. GENITO-URINARY SYSTEM												
1. Acute Nephritis	3	1	...	2	2	...	...	4	...	...	[illegible]	1
2. Bright's Disease	6	3	...	5	3	1	...	9	...	...	[illegible]	9
3. Other Diseases of the Kidneys and Adnexa	5	1	...	5	1	...	...	6	...	...	[illegible]	6
4. Vesical Calculi	...	...	...	...	...	...	...	...	...	...	[illegible]	...
5. Diseases of the Bladder	3	...	...	1	2	...	1	2	...	...	[illegible]	3
6. Diseases of the Male Genital Organs	1	...	...	...	1	...	...	1	...	...	[illegible]	1
7. Metritis	...	...	...	...	...	...	...	...	...	...	[illegible]	...
8. Other Diseases of the Uterus	...	...	...	...	...	...	...	...	...	...	[illegible]	...
9. Ovarian Cysts and other Ovarian Tumors	...	...	...	...	...	...	...	...	...	...	[illegible]	...
10. Other Diseases of Female Genital Organs	...	...	...	...	...	...	...	...	...	...	[illegible]	...
Total	18	5	...	13	9	1	1	22	...	...	[illegible]	23
VIII. PUERPERAL DISEASES												
1. Puerperal Septicæmia	...	2	...	2	...	...	...	2	...	...	[illegible]	2
2. Puerperal Albuminuria and Convul.	...	2	...	2	...	...	1	1	...	...	[illegible]	2
3. Other accidents of Pregnancy, sudden death	...	3	...	3	...	...	1	2	...	...	[illegible]	3
4. Puerperal Diseases of the Breast	...	...	...	...	...	...	...	...	...	...	[illegible]	...
Total	...	7	...	7	...	...	2	5	...	...	[illegible]	7

LAMBTON.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	41
IX. THE SKIN.											
1. Erysipelas	..			...							
2. Skin and Adnexa (cancer excepted)	1			1				1			1
Total	1	..		1	...			1			1
X. LOCOMOTOR SYSTEM.											
1. Pott's Disease	..		...		..	..	...				...
2. Diseases of the Bones and Joints	1	..	..	1	....		1				1
3. Amputation (for unspecified diseases)	...		...								...
Total	1	...	....	1	..	..	1				1
XI. MALFORMATIONS, ETC.											
1. Still-births	22	11	..	33	.	...	...		..	33	33
2. Congen. Debility and Malformations	29	25	....	51		..	51			54	54
3. Other Diseases of Infancy	4	..	....	7	..	..	1	..		4	4
4. Senile Decay	43	35	...	17	61	....	2	76			78
Total	98	71	....	108	61	...	93	76	....	91	169
XII. SUICIDE.											
1. Poison	....	1	...	1	..		1	...			1
2. Strangulation	....	....	...	..	..	..	...			..	...
3. Gas Poisoning	....		..	...		...	...	...	...	...	....
4. Drowning	...	1	.	1	.	...	1	....	..		1
5. Firearms	2	....	..	..	2	..		2	..		2
6. Not Stated	2	....	....	..	1	1	....	1	1		2
Total	4	2	...	2	3	1	2	3	1	...	6
XIII. ACCIDENTS.											
1. Fractures and Dislocations	2	....	....	1	1	..		2		..	2
2. Gunshot	.	1	....	1	....	..		1			1
3. Lightning	....	....	....	....	..	..	...	...	...	..	
4. Drowning	1	....	....	1	....	....	3	1	...	....	4
5. Electric Cars	...	....	..	....	..	....	...	.	....	....	....
6. Railways	1	.	....	2	2	...	1	1	2	....	4
7. Burns and Scalds	2	1	..	5	....	...	3	...	....	...	3
8. Homicide	...	1	..	....	1	.	..	1	....	...	1
9. Other Accidents	11	5	..	13	3	....	7	9	..	1	16
10. Poison	2	....	....	....	1	1	....	2	...	..	2
Total	25	8	....	24	8	1	11	17	2	1	33
XIV. ILL-DEFINED CAUSES.											
1. Dropsy	1	1	....	2	2	1	....	5	...	....	5
2. Tumors	2	1	....	3	....	...	...	3	...	....	3
3. Other Ill-defined Causes	3	6	....	7	2	....	1	8	....	1	9
4. Heart Failure	8	1	....	6	5	1	2	10	....	....	12
Total	17	12	....	18	9	2	3	26	....	1	29
Total from all causes	379	324	1	483	208	13	285	415	4	139	704

Number of Column	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Total from all causes	10	7	3	3	8	16	29	25	24	20	28	22	20	52	89	106	97	6	59	69	45	66	57	54	56	50	44	91	58	55

CAUSES OF DEATHS BY COUNTIES IN 1904.—LANARK.—(Including municipalities of all classes.)

General Diseases.	Sex: Male.	Sex: Female.	Sex: Not stated.	Nativity: Canada.	Nativity: Foreign.	Nativity: Not stated.	Social con.: Single.	Social con.: Married.	Social con.: Not stated.	Ages, Under 5: 0.	1.	2.	3.	4.	5–9.	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 & over.	Not given.	Months: Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	1	1	....	2	....	....	1	1	....	....							1						1						1							1					2
2. Smallpox	....	....	....	....	....	....	....	....	....	....																															.....
3. Measles	....	1	....	1	....	....	1	....	....	....	1																				1										1
4. Scarlet Fever	1	4	....	5	....	....	5	....	....	....	1		1	1	2														1		1			1	1	1					5
5. Whooping Cough	....	....	....	....	....	....	....	....	....	....																															.....
6. Diphtheria and Croup	9	5	....	14	....	....	14	....	....	1	1	2	1	1	6		1	1													1	1	3			3		3	1	2	14
7. Influenza	1	3	....	4	....	....	2	2	....	....		1														3				2		1	1								4
8. Other Epidemic Diseases	....	....	....	....	....	....	....	....	....	....																															.....
Total	12	14	....	26	....	....	23	3	....	1	3	3	2	2	8	..	2	1					1			3			2	2	3	2	4	1	1	5		3	1	1	26
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia		5		5	....	....	1	4	....	....					1				1		1				1		1		1						3			1			5
2. Malarial Fever	....	....	....	....	....	....	....	....	....	....																															.....
3. Tuberculosis and Scrofula	24	24	....	47	1	....	29	19	....	....		1		1		1	1	7	13	4	4		2	5	2	4			7	7	3	4	8	5	2	2	1	1	6	2	48
4. Syphilis	....	....	....	....	....	....	....	....	....	....																															.....
5. Cancer	7	10		13	4	....	1	16	....	....										1		2	1	7	4	1	1			3		1	1	2	1	1	4	1	2	1	17
6. Rheumatism and Gout	4	1	....	5	....	....	....	5	....	....											2					2	1				1	1		2						1	5
7. Diabetes	....	3	....	2	1	....	....	3	....	....																3				1						2					3
8. Other General Diseases	2	4	....	5	1	....	....	6	....	....								1		1	1				2		1					2		1	1	2					6
9. Alcoholism, Acute and Chronic	....	....	....	....	....	....	....	....	....	....																															.....
Total	37	47	....	77	7	....	31	53	....	....		1		1	1	1	4	8	11	6	8	2	3	12	9	20	4		8	11	4	8	9	10	7	7	5	3	8	4	84
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	....	2	....	2	....	....	2	....	....	....			1		1																					1		1			2
2. Simple Meningitis	6	3	....	8	1	....	8	1	....	2		1	1	1			1		1				2							1	2	1	1	2				1	1		9
3. Epidemic Cerebro-spinal Meningitis	....	....	....	....	....	....	....	....	....	....																															
4. Congestion and Hemorrhage of Brain	3	8	....	6	5	....	4	7	....	....															2	7	2			2	1		2		1				2	3	11
5. Softening of the Brain	....	....	....	....	....	....	....	....	....	....																															.....
6. Paralysis without specified cause	14	12	....	18	7	1	3	22	1						1								1	3	9	9	3		3	1	3	5		1	1	1	2	3	4	2	26
7. Insanity	....	....	....	....	....	....	....	....	....	....																															.....
8. Epilepsy	....	....	....	....	....	....	....	....	....	....																															.....
9. Convulsions (not puerperal)	4	10	....	14	....	....	14	....	....	11		2		1																1		2	1		4	3	1	1		1	14
10. Other Nervous Diseases	1	4	....	3	2	....	1	4	....	....										1			1		2	1						2	1	1	1						5
Total	28	39	....	51	15	1	32	34	1	13		3	2	2	2	..	1		1	1			1	3	13	17	5		3	5	6	10	5	4	7	5	3	6	7	6	67

LANARK.—*Continued.*

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. DISEASES OF CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis	2	1		3			2	1							1		1										1					1	1		1						3
3. Organic Heart Disease	7	12		12	7		4	15										1	1				2		6	5	4		3	1	2	1			5	2	1	1			19
4. Angina Pectoris																																									
5. Diseases of Arteries, Atheroma, Aneurism, etc																																									
6. Other Diseases of the Circulatory System																																									
Total	9	13		15	7		6	16							1		1	1	1				2		6	5	5		3	1	2	5	1		6	2	1	1			22
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	2	5		4	3		2	5							1		1							1		3	1			1	1		1		1			2	1		7
2. Chronic Bronchitis	1	1		1	1		1	1																	1	1				1					1						2
3. Broncho-pneumonia	3			3			1	2		1															1	1						1		1						1	3
4. Pneumonia	21	15		33	6		17	22		4	1	1	1				1	1	1		1	2	1	3	7	10	5		6	6	6	2	1		2		3	6	1	6	39
5. Pleurisy	1	2		2	1		2	1						1										2									1						2		3
6. Congestion of the Lungs inc. pul. apoplexy																																									
7. Asthma and Emphysema	2	1		2	1			3																		3						1		1			1				3
8. Other Diseases of Respiratory System	1			1				1																		1			1												1
Total	34	24		46	12		23	35		5	1	1	1	1	1		2	1	1		1	2	1	6	9	19	6		7	8	7	4	3	2	4		4	8	4	7	58
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the Stomach	1			1				1																	1									1							1
2. Other Diseases of Stomach (cancer excepted)	6	2		7	1			8														1	1	2	2	2			1	1	1	1		1	1		2				8
3. Infan. Diarrhœa and Cholera Infantum	2	3		5			5			5																							1	1	1	2					5
4. Diarrhœa and Enteritis (not infantile)	2	3		4	1		3	2					1	1			1								1	1					1				2		1		1		5
5. Dysentery																																									
6. Hernia and Intestinal obstructions	3			2	1			3															1			1	1					1					1		1		3
7. Other Diseases of the Intestines	4	2		6				6												1	1		2				2								1	1	2	1		1	6
8. Diseases of the Liver	4	3		5	2		1	5	1																1	5	1			2	1				1				3		7
9. Peritonitis (not puerperal)		3		3			1	2														2		1								1			1				1		3
10. Iliac Abscess and Appendicitis	6	1		5	2		4	2	1				1			1	2			1		1			1				1				1	1		2		2			7
Total	28	17		38	7		14	29	2	5			2	1		1	3			2	1	4	4	3	6	9	4		2	3	3	3	2	4	7	5	6	3	6	1	45
VII. GENITO-URINARY SYSTEM																																									
1. Acute Nephritis		1		1			1													1										1											1
2. Bright's Disease	5	1		5	1		1	5												1			2	1	2					1	1			2	1			1			6
3. Other Diseases of the Kidneys and Adnexa	3	2		4	1			5													1	1		1		1	1		1	1				1	1			1			5
4. Vesical Calculi	1				1			1																		1														1	1
5. Diseases of the Bladder	1	1		2			1	1									1									1										1			1		2
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	10	5		12	3		3	12									1			2	1	1	2	2	2	3	1		1	3	1			3	2	1		2	1	1	15
VIII. PUERPERAL DISEASES																																									
1. Puerperal Septicæmia																																									
2. Puerperal Albuminuria and Convulsions		2		2			1	1									1											1							1			1			2
3. Other accidents of Pregnancy, sudden death		3		3			1	2										1	1	1													1		1				1		3
4. Puerperal Diseases of the Breast																																									
Total		5		5			2	3									1	1	1	1								1					1		2			1	1		5

IX. OTHER DISEASES OF THE SKIN.																																								
1. Erysipelas	1			1			1																					1	1												1
2. Other dis. of Skin & Adnexa (cancer excepted)																																									
Total	1			1			1																					1	1												1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified Diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still Births	11	7	1	22			22			22																				2	2		2	8	1	2	1	1	1	2	22
2. Congenital Debility and Malformations	20	17		37			37			37																			5	5	2	3	3	3	6	2	4	1	1	2	37
3. Other Diseases of Infancy																																									
4. Senile Decay	15	41		40	45	1	5	80	1																	35	51		6	9	10	6	11	5	2	11	7	7	6	6	86
Total	79	66	1	99	45	1	64	80	1	59																35	51		11	16	14	9	16	16	9	15	12	9	8	10	145
XII. SUICIDE.																																									
1. Poison	1			1			1														1										1										1
2. Strangulation	1			1			1																	1														1			1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total	2			2			2														1			1							1							1			2
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot	2			2			1	1										1																			1	1			2
3. Lightning																																									
4. Drowning	2	1		3			3				1	1						1														1	1						1		3
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	1			1				1																		1							1								1
8. Burns and Scalds	1			1			1							1																									1		1
9. Homicide																																									
10. Other Accidents	8			5	3		1	7								1					2			3	2								1		1	2		1	3		8
Total	14	1		12	3		6	9			1	1		1		1		2			3			3	2	1						1	3		1	2	1	2	5		15
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	6	1		6	1			7																1	2	1				1	1	1		1	1				1	1	7
2. Tumors	1	2		3			3											1							1	1				1			1	1							3
3. Other Ill Defined Causes	1	1		3	2		2	3											1			1	1		2					2	1					1				1	5
4. Heart Failure	4	6		8	2		4	6									1			1		1	1	1	4			1	1	2	1	2			1	2				1	10
Total	9	16		20	5		9	16									1	1	1	1		2	2	2	9	5		1	1	6	3	3	1	2	2	3			1	3	25
Total from all causes	263	246	1	404	104	2	216	280	4	83	5	9	7	8	13	3	16	15	19	13	15	11	19	32	56	107	75	3	39	55	44	45	45	42	48	45	32	39	42	34	510

CAUSES OF DEATH BY TOWNS IN 1904.—LEEDS AND GRENVILLE.—(Including Municipalities of all Classes.)

General Diseases.

Number of Column	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Soc'l con. Single.	Married.	Not stated.
	1	2	3	4	5	6	7	8	9
I. COMMUNICABLE (EPIDEMIC) DISEASES.									
1. Typhoid Fever	8	5	...	1	2	...	6	7	...
2. Smallpox	...	...	...	...	...	...	...	...	...
3. Measles	...	...	...	...	...	...	...	...	...
4. Scarlet Fever	3	2	...	5	...	...	4	...	1
5. Whooping Cough	...	1	...	1	...	...	1	...	...
6. Diphtheria and Croup	5	7	...	12	...	...	12	...	...
7. Influenza	9	7	...	10	6	...	8	8	...
8. Other Epidemic Diseases	...	...	...	...	...	...	...	...	...
Total	25	22	...	39	8	...	21	15	1
II. OTHER GENERAL DISEASES.									
1. Pyaemia and Septicaemia	4	4	...	8	...	...	1	1	...
2. Malarial Fever	...	...	...	...	...	...	...	...	...
3. Tuberculosis and Scrofula	53	62	...	104	9	2	87	18	10
4. Syphilis	...	...	...	...	...	...	...	...	...
5. Cancer	8	14	...	16	5	1	2	19	1
6. Rheumatism and Gout	6	1	...	6	1	...	2	5	...
7. Diabetes	3	4	...	6	1	...	2	1	1
8. Other General Diseases	9	3	...	12	...	...	4	7	1
9. Alcoholism, Acute and Chronic	...	...	...	...	...	...	...	...	...
Total	83	88	...	152	16	5	71	87	13

Local Diseases.

Number of Column	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Soc'l con. Single.	Married.	Not stated.
III. DISEASES OF NERVOUS SYSTEM.									
1. Encephalitis	2	...	...	2	...	...	1	1*	...
2. Simple Meningitis	7	4	...	11	...	...	10	1	
3. Epidemic Cerebro-spinal Meningitis	2	1	...	3	...	...	3		...
4. Congestion and Hemorrhage of Brain	16	17	...	18	10	5	3	30	...
5. Softening of the Brain	1	2	...	2	1	...	...	3	...
6. Paralysis without specified cause	19	21	...	26	13	1	10	28	2
7. Insanity	5	6	...	11	...	...	3	8	...
8. Epilepsy	4	4	...	7	1	...	4	3	1
9. Convulsions (not puerperal)	5	4	...	9	...	...	8	1	...
10. Other Nervous Diseases	3	4	...	7	...	...	2	5	...
Total	64	63	...	96	25	6	44	80	3

Ages.

Number of Column	Under 5. 0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
I. COMMUNICABLE (EPIDEMIC) DISEASES.																			
1. Typhoid Fever	...						1	2	2	3	1	1				3	...		
2. Smallpox	...																		
3. Measles																			
4. Scarlet Fever		1		1		3													
5. Whooping Cough	1																		
6. Diphtheria and Croup				1	2	1	2	1	1			1							
7. Influenza	4	1						1		1						2	1	6	
8. Other Epidemic Diseases																			
Total	5	2		2	2	7	2	4	3	4	1	2				5	1	6	
II. OTHER GENERAL DISEASES.																			
1. Pyaemia and Septicaemia	...	1	1					1	1					1	1	1	1		
2. Malarial Fever																			
3. Tuberculosis and Scrofula	..	1	2	1	2	2	1	4	11	16	14	17	8	6	9	6	5	1	1
4. Syphilis																			
5. Cancer	...										2		1		5	6	5	3	
6. Rheumatism and Gout							1			1						2	2	1	
7. Diabetes	...				1								1			1	2	2	
8. Other General Diseases	...									1	2		1	1	2	3		1	1
9. Alcoholism, Acute and Chronic	...																		
Total	...	2	3	1	3	2	7	5	15	18	18	17	11	8	17	19	15	8	2
III. DISEASES OF NERVOUS SYSTEM.																			
1. Encephalitis						1				1									
2. Simple Meningitis	3	1		1				2	1	1	1			1					
3. Epidemic Cerebro-spinal Meningitis	1										1						1		
4. Congestion and Hemorrhage of Brain	...						1						1	1	1	12	7	9	1
5. Softening of the Brain	...																2	1	
6. Paralysis without specified cause	...								2		1	1	2	1	5	5	12	11	
7. Insanity	...									2			1	1	1	3	2		1
8. Epilepsy	...						1		3			1	1				1		1
9. Convulsions (not puerperal)	3		1	1	1	1		1							1				
10. Other Nervous Diseases							2								1	2	2		
Total	7	1	1	2	1	2	4	3	6	4	3	2	5	4	9	22	27	21	3

Months.

Number of Column	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.													
1. Typhoid Fever	1	1	3	1	1	1		2	2		1		13
2. Smallpox													....
3. Measles													....
4. Scarlet Fever	2					2	1						5
5. Whooping Cough						1							1
6. Diphtheria and Croup		2	1		1	2		1	3		1	1	12
7. Influenza	1	4	5	2								2	16
8. Other Epidemic Diseases													....
Total	4	9	9	3	2	6	1	3	5		2	3	47
II. OTHER GENERAL DISEASES.													
1. Pyaemia and Septicaemia			2		1		1		2		1	1	8
2. Malarial Fever													......
3. Tuberculosis and Scrofula	13	15	12	6	11	8	13	10	8	7	6	6	115
4. Syphilis													......
5. Cancer		5	1	1	2	7	1	3	1			1	22
6. Rheumatism and Gout	1				1		1	1	1	1		1	7
7. Diabetes		1		2	1		1	1				1	7
8. Other General Diseases	2		1	1	1	2	2		1	1		1	12
9. Alcoholism, Acute and Chronic													......
Total	16	21	16	10	17	17	19	15	13	9	7	11	171
III. DISEASES OF NERVOUS SYSTEM.													
1. Encephalitis		1										1	2
2. Simple Meningitis	1	1	2		2	2		1	1			1	11
3. Epidemic Cerebro-spinal Meningitis			1					1			1		3
4. Congestion and Hemorrhage of Brain	2	1	3	6	2	2	1	1	3	7	3	2	33
5. Softening of the Brain		1								1		1	3
6. Paralysis without specified cause	7	3	3	2	3	4	3	1	1	4	6	3	40
7. Insanity	2	2				1	1	1	3		1		11
8. Epilepsy	1	2				1					2	2	8
9. Convulsions (not puerperal)	1		1	1		1	2	1	1		1		9
10. Other Nervous Diseases		1			1	1	2		1			1	7
Total	14	12	10	9	8	12	9	6	10	12	14	11	127

IV. DISEASES OF CIRCULATORY SYSTEM.											
1. Pericarditis	....	....	....	....	....	....	....	....	....	....	......
2. Endocarditis	6	....	....	5	1	...	1	4	1	....	3
3. Organic Heart Diseases	32	23	....	45	10	...	9	43	3	...	55
4. Angina Pectoris	....	....	....	....	....	....	....	....	....	....	......
5. Arteries, Atheroma, Aneurism, etc.	2	2	....	1	2	1	2	1	1	.	4
6. Other Diseases of Circulatory System	..	....	....	....	....	....	....	....	....	....	......
Total	40	25	..	51	13	1	12	48	5	....	65
V. RESPIRATORY SYSTEM.											
1. Acute Bronchitis	5	10	...	12	3	....	7	7	1	2	15
2. Chronic Bronchitis	1	1	....	2	....	....	....	2	..	....	2
3. Broncho-pneumonia	5	2	...	6	....	1	5	2	....	3	7
4. Pneumonia	21	25	...	36	9	1	22	22	2	8	46
5. Pleurisy	7	3	....	7	2	1	2	8	....	....	10
6. Congestion of the Lungs, inc. pul. apop.	1	1	...	1	1		2	....	...	1	2
7. Asthma and Emphysema	2	....	....	1	1	....	..	2	....	..	2
8. Other Diseases of Respiratory System	....	....	....	....	....	..	....	....	....	....	......
Total	42	42	..	65	16	3	38	43	3	14	84
VI. DIGESTIVE SYSTEM.											
1. Ulcer of the Stomach	....	1	...	1	....	....	1	..	..	....	1
2. Other Diseases of Stomach (cancer excepted)	8	4	..	10	2	....	4	8	..	....	12
3. Infan. Diarrhoea and Cholera Infantum	10	7	....	17	....	....	17	....	....	14	17
4. Diarrhoea and Enteritis (not infantile)	4	1	....	4	1	....	3	1	1	...	5
5. Dysentery	1	....	....	1	....	..	1	....	....	....	1
6. Hernia and Intestinal obstructions	..	1	..	...	1	..	..	1	....	....	1
7. Other Diseases of the Intestines	2	1	....	3	....	....	2	1	....	..	3
8. Diseases of the Liver	6	4		9	..	1	4	6	...		10
9. Peritonitis (not Puerperal)	5	5	...	4	2	...	2	3	1		6
10. Iliac Abscess and Appendicitis	2	2		3	1	...	3	1	..		4
Total	36	24	..	52	7	1	37	21	2	14	60
VII. GENITO-URINARY SYSTEM.											
1. Acute Nephritis	3		..	2	1	...	2	1	....	1	3
2. Bright's Disease	6	4	.	8	2	.	4	5	1		10
3. Other Diseases of Kidneys and Adnexa	4	1	.	4	1	....	1	4	.	...	5
4. Vesical Calculi	..	..	....	....	....	....	..	....	....	....	
5. Diseases of the Bladder	..	..	..	...	3	..	.	2	1	..	3
6. Diseases of the Male Genital Organs	..	....	....	....	..	...	..	..	...		
7. Metritis	..	....	....	....	..	....	..	..	....	...	
8. Other Diseases of the Uterus	.	..	..		..	...	..	..	....	...	
9. Ovarian Cysts and other Ovarian Tumors	.	....	....	....		....	..	....	....	....	
10. Other Diseases of Female Genital Organs	...	...	....	....	....	....	..	....	....	....	
Total	16	5	.	14	7	....	7	12	2	1	21
VIII. PUERPERAL DISEASES.											
1. Puerperal Septicaemia	....	..	...	....	....	..	...	....	....	....	2
2. Puerperal Albuminuria and Convulsions	...	2	....	2	....	..	...	2	.	....	6
3. Other acc. of Preg., sudden death	..	6	...	5	1	..	.	6	...	....	6
4. Puerperal Disease of the Breast	...	....	....	....	....	....	..	....	....	....	...
Total	.	8	..	7	1	....	...	8	....	....	8

LEEDS AND GRENVILLE.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1				1			1																		1				1											1
2. Skin and Adnexa (cancer excepted)																																									
Total	1				1			1																		1				1											1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	27	12	1	40			40			40																			2	3	8	2	5	7	1		4	2	2	4	40
2. Congen. Debil. and Malformations	38	29	1	68			68			68																			2	10	5	7	6	1	7	6	7	2		7	68
3. Other Diseases of Infancy	2	4		6			6			3	2	1																					1			1		1	3		6
4. Senile Decay	68	74		50	87	5	11	126	5																6	40	94	2	16	11	17	5	12	10	5	15	16	7	16	12	142
Total	135	119	2	164	87	5	125	126	5	111	2	1													6	40	94	2	20	24	30	14	21	21	13	22	27	12	26	23	256
XII. SUICIDE.																																									
1. Poison		1		1			1																	1														1			1
2. Strangulation		1		1			1																	1					1												1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total		2		2			2																	2					1									1			2
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	2			1	1		2										1	1																	1	1					2
2. Gunshot	3			3			3									1		1	1												1		1				1				3
3. Lightning																																									
4. Drowning	3			2	1		2	1									1			1								1				1							1	1	3
5. Electric Cars																																									
6. Bicycles																			1																1						1
7. Railways	1			1				1																																	
8. Burns and Scalds																																									
9. Homicide	6	4		7	3		4	6		1								1			1		1	1		3	1	1	2	2	2		1		2	1					10
10. Other accidents	1	1		2			2							1		1																			1	1					2
11. Poison																																									
Total	16	5		16	5		13	8		1				1		2	2	3	2	1	1		1	1		3	1	2	2	2	3	1	2		5	3	1		1	1	21
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	5	8		7	6		4	9																	3	6	3	1	1	1	1		1	2	1	1	1		2	2	13
2. Tumors		3		3				3															1		1	1			1								1	1			3
3. Other ill-defined causes	1	13		12	2		8	5	1	1	1						1			1	1		2	2	4			1	2		3	2		3	1	2		1			14
4. Heart Failure	9	4		11	2		4	7	2									1		2			1	3	6				2		2	3	1	2	1	2					13
Total	15	28		33	10		16	24	3	1	1						1	1		3	1		4	[illegible]	14	7	3	2	6	1	6	5	2	7	3	5	2	2	2	2	43
Total from all causes	473	431	2	691	196	19	396	473	37	154	13	12	6	9	15	22	22	40	36	28	29	25	21	56	108	136	161	13	80	92	95	66	78	76	69	76	78	51	70	76	906

CAUSES OF DEATHS BY COUNTIES IN 1904—LENNOX AND ADDINGTON (Including Municipalities of all Classes).

General Diseases.	Sex.			Nativity.			Social Condition.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign	Not stated.	Single.	Married.	Not stated.	0.1	1.	2.	3.	4.	5–9.	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44	45–49.	50–59	60–69.	70–79.	80 and over.	Not given.	January.	February	March.	April.	May.	June.	July.	August.	September.	October.	November.	December	Totals.
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever		2		2			1	1												2										1						1					2
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	2	2		4			4						1		3														1				2						1		4
7. Influenza	2	2		3	1		2	2											1						1		2		2	1	1										4
8. Other Epidemic Diseases																																									
Total	4	6		9	1		7	3					1		3				1	2					1		2		3	2	1		2			1			1		10
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia																																									
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	11	14		23	2		5	14	6								3	5	3	2	3	4	1	2		2				2	4	2	3	7		1	1	2	2	1	25
4. Syphilis																														1											
5. Cancer	4	4		7	1		1	6	1											1				2	3	1	1		3				2			1	1	1			8
6. Rheumatism and Gout		1			1			1																	1					1											1
7. Diabetes	2			2			1	1			1														1						1								1		2
8. Other General Diseases	2	1		3				2	1												1				2					1								1	1		3
9. Alcoholism, Acute and Chronic																																									
Total	19	20		35	4		7	24	8		1						3	5	3	3	1	4	1	4	7	3	1		3	4	5	2	5	7		2	2	4	4	1	39
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis		1		1			1			1																						1									1
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	5	3	1	6	2	1		5	4											1					1	3	4					1	1			3		1	1	2	9
5. Softening of the Brain	1	2		1	2			3																	2	1			1								1		1		3
6. Paralysis without specified cause	10	11		17	4		3	17	1			1											2	2	6	8	2		2		2	2	4		2	3	1	3		2	21
7. Insanity	1	1		2			1	1																	2								1	1							2
8. Epilepsy																																									
9. Convulsions (not puerperal)	4	4		8			8			7							1												2		1	2		1				1		1	8
10. Other Nervous Diseases	1			1			1			1																				1											1
Total	22	22	1	36	8	1	14	26	5	9		1					1			1			2	2	11	12	6		5	1	3	6	6	2	2	6	2	5	2	5	45

LENNOX AND ADDINGTON.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	9	5		7	5	2	1	11	2												2		1	2	6	2	1		2	1	1	1		1		2	2			1	14
4. Angina Pectoris		1		1				1															1									1									1
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of the Circulatory System																																									
Total	9	6		8	5	2	1	12	2												2		2	2	6	2	1		2	1	1	2		1		2	2			1	15
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis																																									
2. Chronic Bronchitis																																									
3. Broncho-pneumonia																																									
4. Pneumonia	10	5		7	8		3	10	2	1						1	1				1			1	1	3	6		2	5	2	2		2			1			1	15
5. Pleurisy																																									
6. Congestion of the Lungs, inc. pul. apoplexy																							1							1											1
7. Asthma and Emphysema		1			1		1																																		
8. Other Diseases of the Respiratory System																																									
Total	10	6		7	9		4	10	2	1						1	1				1		1	1	1	3	6		2	6	2	2		2			1			1	16
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the stomach		1		1				1															1														1				1
2. Other Diseases of Stomach (cancer excepted)	1	1		2				2																1	1									1	1						2
3. Infantile Diarrhœa and Cholera Infantum	1	1		2			2			1	1																				1					1					2
4. Diarrhœa and Enteritis (not infantile)	1			1				1												1																1					1
5. Dysentery		1		1			1											1														1									1
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	1	1		2			1	1										1							1					2											2
9. Peritonitis (not puerperal)	2	1		3			3									2						1								1			1			1					3
10. Iliac Abscess and Appendicitis		1		1			1												1																				1		1
Total	6	7		13			8	5		1	1					2		2	1	1		1	1	1	2					3	1	1	1	1	1	3	1		1		13
VII. GENITO URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	1	3		3	1		1	2	1											1		1		2							1				1	1	1				4
3. Other Diseases of Kidneys and Adnexa		1				1	1																	1																1	1
4. Vesical Calculi																																									
5. Diseases of the Bladder	2			1		1		1	1																	2											1		1		2
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	3	4		4	1	2	2	3	2											1		1		3		2					1				1	1	2		1	1	7

VIII. PUERPERAL DISEASES.																																							
1. Puerperal Septicaemia																																							
2. Puerperal Albuminuria and Convulsions		1		1				1									1																			1			1
3. Other Accidents of Pregnancy, sudden death		1		1				1								1																				1			1
4. Puerperal Diseases of the Breast																																							
Total		2		2				2								1	1																			2			2
IX. THE SKIN.																																							
1. Erysipelas																																							
2. Skin and Adnexa (cancer excepted)																																							
Total																																							
X. LOCOMOTOR SYSTEM.																																							
1. Pott's Disease																																							
2. Diseases of Bones and Joints																																							
3. Amputation (for unspecified diseases)																																							
Total																																							
XI. MALFORMATIONS, ETC.																																							
1. Still Births	5	3		8			8			8																		2		1			1		1	1	1	1	8
2. Congen. Debility and Malformation	10	15		25			25			25																	3	3	1		3	3	1	1	1	1	4	4	25
3. Other Diseases of Infancy		1		1			1					1																									1		1
4. Senile Decay	25	30		29	19	7	4	47	4															1	22	32	4	8	6	4	7	4	6	3	5	4		4	55
Total	40	49		63	19	7	38	47	4	33		1												1	22	32	7	13	7	5	10	7	8	4	7	6	6	9	89
XII. SUICIDE.																																							
1. Poison																																							
2. Strangulation	1	1		2				1	1															1	1				1									1	2
3. Gas Poisoning																																							
4. Drowning																																							
5. Firearms																																							
Total	1	1		2				1	1															1	1				1									1	2
XIII. ACCIDENT.																																							
1. Fractures and Dislocations																																							
2. Gunshot																																							
3. Lightning																																							
4. Drowning	3			2	1		2	1						1		1			1													1	2						3
5. Electric Cars																																							
6. Railways	1			1				1												1												1							1
7. Burns and Scalds		1		1					1								1																		1				1
8. Other Accidents	5	2		6	1		1	6							1								3	1	2		2				1		1		1	1	1		7
Total	9	3		10	2		3	8	1					1	1	1	1		1	1			3	1	2		2				1	2	3		2	1	1		12
XIV. ILL-DEFINED CAUSES.																																							
1. Dropsy		4		4			2	2													1			1		2				1					1	1	1		4
2. Tumors	1	1		1	1			2													1		1						1								1		2
3. Other Ill-Defined Causes	2	2		3	1		1	3		1													1	1	1				1		1					1		1	4
4. Heart Failure	1	2		3			1	2								1			1		1							1				1	1						3
Total	4	9		11	2		4	9		1						1			1		3		2	2	1	2		1	2	1	1	1	1		1	2	2	1	13
Total from all causes	127	135	1	200	51	12	88	150	25	45	2	2	1	4	4	8	9	5	10	8	9	7	18	33	48	50	24	31	24	19	26	26	16	19	20	20	18	20	263

CAUSES OF DEATHS BY COUNTIES IN 1904.—LINCOLN.—(Including Municipalities of all Classes).

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Soc'l con. Single.	Soc'l con. Married.	Soc'l con. Not stated.	Ages. Under 5. 0	1	2.	3.	4	5–9	10–14.	15–19.	20–24	25–29	30–34	35–39.	40–44.	45–49.	50–59	60–69	70–79	80 and over	Not given	Months. January.	February.	March.	April.	May.	June	July.	August.	September	October.	November	December	Totals.
Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	8	5	...	12	1	.	6	7	...	....							1	4	1	2	1	1		1	2				2	1	2		2	1	1			2		2	13
2. Smallpox	....	....	..	..	....	....	...	..		....																															....
3. Measles	...	....	...	..	....	...	....	...	....	...																															....
4. Scarlet Fever	3	1	...	4	....	....	3	1	..	...		1		1		1				1									1	1	1	1									4
5. Whooping Cough	1	..	....	1	....	..	1	....	...	....	1																										1				1
6. Diphtheria and Croup	4	6	....	10	....	...	10	....	....	....	1	2			5	2														1	1		1		1				2	4	10
7. Influenza	...	1	....	1	..	..	1	...	....	....	1																		1												1
8. Other Epidemic Diseases	....	....	....	....	....	....	....	....	....	..																															....
Total	16	13	...	28	1	....	21	8	...	....	3	3	..	1	5	3	1	4	1	3	1	1		1	2				4	3	4	1	3	1	2		1	2	2	6	29
II. OTHER GENERAL DISEASES.																																									
1. Pyæmia and Septicæmia	4	....	....	2	2	...	1	3	....	....					1							1	1		1											1	1	2			4
2. Malarial Fever	..	....	....	....	..	....	....	....	....	....																															....
3. Tuberculosis and Scrofula	23	25	....	38	10	...	26	21	1	....	1				2	1	5	6	5	3	6	4		7	6	2			3	1	4	3	5	7	5	6	1	2	4	1	48
4. Syphilis	...	...	....	...	..	....	....	....	..	...																															....
5. Cancer	14	15	...	16	13	...	2	25	2	...										1			3	9	8	6	2		2	1	2	2	3	2	3	1	5	3	1	4	29
6. Rheumatism and Gout	2	....	....	1	1	...	....	2	....	...															1	1			1									1			2
7. Diabetes	1	2	....	2	1	....	....	3	...	..															1	2					1			1					1		3
8. Other General Diseases	3	5	...	6	2	....	1	7	....	....							1		1		1		1		2	1	1				1		2	1	1	1		1		1	8
9. Alcoholism, Acute and Chronic	....	....	....	....	....	....	...	...	...	..																															....
Total	47	47	....	65	29	....	30	61	3	...	1				3	1	6	6	6	4	7	5	5	16	19	12	3	..	6	5	8	5	10	11	9	9	10	9	6	6	94
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1	2	....	3	....	....	3	....	...	...					1		1	1													2					1					3
2. Simple Meningitis	4	3	...	6	1	...	7	....	....	4	1			1			1													1	1	1			1	1	2				7
3. Epidemic Cerebro spinal Meningitis	1	1	....	2	....	....	2	....	....	1					1																		1					1			2
4. Congestion and Hemorrhage of the Brain	7	9	....	10	6	...	1	14	1	...											1	1		2	2	4	6		1	1	2	1	2	1	2		2	2	1	1	16
5. Softening of the Brain	...	1	....	1	...	...	1	....	...	....																1														1	1
6. Paralysis without specified cause	6	8	...	5	9	....	2	11	1	....													1		4	6	3		2	2	3	1	4			1	1				14
7. Insanity	...	...	....	....	....	....	...	...	....	....																															....
8. Epilepsy	1	....	....	...	....	1	....	1	....	....																1									1						1
9. Convulsions (not puerperal)	3	4	....	7	....	....	7	....	....	4	2	1																			1	1	1	1	2				1		7
10. Other Nervous Diseases	2	1	....	1	2	....	....	3	....	....								1							2				1		1	1									3
Total	25	29	....	35	18	1	23	29	2	9	3	1	..	1	2	..	2	2	..	..	1	1	1	2	8	12	9	..	4	4	10	5	8	2	6	3	5	3	2	2	54

IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis		1		1				1																	1						1										1
3. Organic Heart Diseases	27	15		27	15		7	33	2											1	2	1	1	8	12	14	3		5	3	2	10	3	5		1	1	3	1	8	42
4. Angina Pectoris	1			1				1																	1												1				1
5. Arteries, Atheroma, Aneurism, etc.	2				2			2												1						1					1		1								2
6. Other Diseases of Circulatory System																																									
Total	30	16		29	17		7	37	2											2	2	1	1	8	14	15	3		5	3	4	10	4	5		1	2	3	1	8	46
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	5	4		7	2		3	5	1	2														1		3	3		2	1		1	2		2			1			9
2. Chronic Bronchitis		2		1	1		1	1																		2						1							1		2
3. Broncho-pneumonia	2	3		2	3		1	4							1								1			2	1		1			2						1	1		5
4. Pneumonia	9	16		17	7	1	9	15	1	1					1		1	2	2	1	1	1			6	7	2		3	7	1	2	1	2	1		2	2	1	3	25
5. Pleurisy	3	1		1			3	1		1					1									2					1		1	1		1							4
6. Congestion of the Lungs	1	3		2	2		2	2		1													1			1	1			1	1		1							1	4
7. Asthma and Emphysema	1	2		1	2			3																1	1		1			1	1							1			3
8. Other Diseases of the Respiratory System																																									
Total	21	31		34	17	1	19	31	2	5					3		1	2	2	1	1	1	2	4	7	15	8		7	10	4	7	4	3	3		2	5	3	4	52
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	2				2			2															2															2			2
3. Infantile Diarrhœa and Cholera Infantum	7	8		15			15			11	3	1																					1		1	1	9				15
4. Diarrhœa and Enteritis (not infantile)	3	4		7			1	6					1											1	2	2	1		2				1	1			1			2	7
5. Dysentery																																									
6. Hernia and Intestinal obstructions		2		1	1			2																		1	1								1	1					2
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	4	1		1	1		1	4																2	3								3			1	1				5
9. Peritonitis (not puerperal)	1	1		2			1	1						1						1																	1			1	2
10. Iliac Abscess and Appendicitis	2	1		2	1		2	1							1				1	1											1					2					3
Total	19	17		31	5		20	16		11	3	1	1	1	1				1	2			2	3	5	3	2		2		1		5	1	2	8	12	2		3	36
VII. GENITO-URINARY SYSTEM																																									
1. Acute Nephritis	2			2			1	1							1										1						1								1		2
2. Bright's Disease	6	6		6	6		2	10										1		2				2	2	4	1			1	3	3		1	1	1		2			12
3. Other Diseases of Kidneys and Adnexa	2	1		2	1		1	2																	2	1							1				1			1	3
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs	2			1	1			2																		1	1						1						1		2
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		1		1			1																		1														1		1
10. Other Diseases of Female Genital Organs		1			1			1																		1											1				1
Total	12	9		12	9		5	16							1			1		2				2	6	7	2			1	4	3	2	1	1	1	2	2	3	1	21
VIII. PUERPERAL DISEASES																																									
1. Puerperal Septicæmia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other accidents of Preg. and sudden death		2		2				2													1	1											1			1					2
4. Puerperal Diseases of the Breast																																									
Total		2		2				2													1	1											1			1					2

LINCOLN. *Continued.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	14	6	4	24			24			24																			1	1	3	2	5	1	2	3	3		1	2	24
2. Congen. Debility and Malformations	17	16	1	34			31			34																			3	1	5	1	5	1	2	5	4	1	5	1	34
3. Other Diseases of Infancy	1			1			1				1																													1	1
4. Senile Decay	27	21		25	23		8	40																		15	33		2	5	7	4	9	2	1	2	2	5	4	5	48
Total	59	43	5	84	23		67	40		58	1															15	33		6	7	15	7	19	4	5	10	9	6	10	9	107
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation	1			1				1																	1						1										1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Not specified	1			1				1																	1								1								1
Total	2			2				2																	2						1		1								2
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	2	1			3			3																		1	2							1				1	1		3
2. Gunshot																																									
3. Lightning																																									
4. Drowning	5	2		6	1		6	1				1				1	2						1		1		1								3	1	3				7
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	1			1			1											1																1							1
8. Burns and Scalds	2	3		5			4	1				1					1	1						2						1		1		1					1	1	5
9. Homicide																																									
10. Other Accidents	9			7	1	1	4	4	1	1				1	1		1			2		1		1	1				1	1			1	1		1	1	1	1	1	9
11. Poisoning	1	1		1	1			2																	2				2												2
Total	20	7		20	6	1	15	11	1	1		2		1	1	1	4	2		2		1	1	3	4	1	3		3	2		1	1	4	3	2	4	2	3	2	27
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy		5		2	2	1	1	4													1				2	1	1		1	1			1					1	1		5
2. Tumors	1	1		2				2														1				1			1											1	2
3. Other Ill-Defined Causes	4	2		3	2	1	2	3	1												2			2	1	1			1		1		1					1	1	1	6
4. Heart Failure	1	4		4	1			5																2	2	1			2								1	1		1	5
Total	6	12		11	5	2	3	14	1												3	1		4	5	4	1		5	1	1		2				1	3	2	3	18
Total from all causes	257	226	5	353	130	5	210	267	11	84	11	7	1	4	16	5	14	17	10	16	16	12	12	43	72	84	64	..	42	36	52	39	60	32	31	35	48	37	32	44	488

CAUSES OF DEATHS BY COUNTIES IN 1904.—MIDDLESEX.—(Including Municipalities of all classes.)

General Diseases.	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Social con. Single.	Married.	Not stated.	Ages. Under 5. 0,1	1,	2,	3,	4	5-9.	10-14	15-19	20-24.	25-29	30-34.	35-39	40-44.	45-49.	50-59	60-69	70-79.	80 and over.	Not given.	Months. January.	February.	March	April	May.	June.	July.	August	September.	October.	November	December.	Total.
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	11	11		19	3		11	11			1					3	2	4	2	3	1	1	1	2	2				2	1	1	1				6	7	1	1	2	22
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	9	7		15	1		16				1	4	2	4	2														2		1	5	1	2		2			1	1	16
5. Whooping Cough	5			5			5			4	1																				1					3				1	5
6. Diphtheria and Croup	19	13		32			31		1	4	6	1	1	3	8	2	2				1							1	3	6	3	1	2	5	1	1	4	1	2	5	32
7. Influenza	9	9		11	7		2	16												1	2		1	2	2	1	6		2	4	6	2	1		1					2	18
8. Other Epidemic Diseases																																									
Total	53	40		82	11		65	27	1	8	12	5	6	7	10	5	4	4	2	1	1	1	2	1	4	1	6	11	9	11	12	7	4	5	2	12	11	2	1	11	93
II. OTHER GENERAL DISEASES.																																									
1. Pyæmia and Septicæmia	9	4		11	2		4	8	1		1									2	3	2		1	2	1	1		2	2	1	1	1		1	2			2		13
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	81	74		125	30		80	68	7		5		1	1	1	1	9	17	21	25	10	11	11	13	16	4	2	2	12	14	16	18	19	9	15	12	10	12	11	7	155
4. Syphilis																																									
5. Cancer	35	39		39	35		10	63	1		1			1					3	1	3	8	8	16	15	13	5		8	5	7	10	6		6	1	7	5	8	8	74
6. Rheumatism and Gout	2	5		4	3		1	6										1			2	1		1	1		1				3	1	1						1	1	7
7. Diabetes	3	11		12	2		5	8	1								2	2	1	1		1	1	1	1	1			2	1			2	2	2		1	2	2		11
8. Other General Diseases	9	11		16	4		6	13	1			1				1			1	2			1	2	5	3	1			3	3	2	1	1	3	3	1	2	1		20
9. Alcoholism, Acute and Chronic																																									
Total	139	144		207	76		106	166	11		7	1	1	2	1	7	11	20	26	28	18	23	27	31	40	25	10	2	24	26	30	32	30	12	27	21	19	21	25	16	283
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	5	3		7	1		1	1		1	1				1	1							1		2		1			1		1				1		1		1	8
2. Simple Meningitis	7	8		15			11	1		8	1		1			1								4					3	2	2	1	1	2	1	1		1		1	15
3. Epidemic Cerebro-spinal Meningitis	1	2		2	1		2	1								1					1				1				1					1				1			3
4. Congestion and Hemorrhage of the Brain	24	18		21	21		5	36	1										1			1	1	6	9	11	9	2	3	4	4	1	3	5	1	3	1	6	5	6	42
5. Softening of the Brain	3	1		2	2		1	3																2		2			1		1					2					4
6. Paralysis without specified cause	28	24		31	21		6	43	3									1	1	3	1	1	1	3	12	18	11		3	3	10	2	8	4	4		4	2	5	7	52
7. Insanity	3	1		4			2	2													1	1			1			1	1	1		1						1			4
8. Epilepsy	2	3		3	2		1	1										1		2		1					1				1			2		1				1	5
9. Convulsions (not puerperal)	18	7		25			25			23	2																		1	1	4	3	2	4	1	1	2	1	1	1	25
10. Other Nervous Diseases	4	5		5	1		1	7	1							1					1		2		1	3		1	2		1	2	1			1	1			1	9
Total	95	72		115	52		61	101	5	32	1		1		1	1		2	2	5	1	1	5	15	26	30	22	1	15	12	23	11	15	18	7	16	8	13	11	18	167

MIDDLESEX.—*Continued*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IV. CIRCULATORY SYSTEM																				
1. Pericarditis		2		2				2										1		
2. Endocarditis	2	1		3			3								1		1			1
3. Organic Heart Diseases	11	36		31	45	1	12	53	15							1	1		3	1
4. Angina Pectoris	4			2	2			1												
5. Arteries, Atheroma, Aneurism, etc	7	1		5	3			8												1
6. Other Diseases of Circulatory System		1		1			1			1										
Total	57	41		47	50	1	16	67	15	1					1	1	2	1	3	6
V. RESPIRATORY SYSTEM																				
1. Acute Bronchitis	12	22		14	20		13	21		7	2	1								
2. Chronic Bronchitis	3	3		3	3		1	5		1										
3. Broncho-pneumonia	3	2		3	1		2	3		2									1	
4. Pneumonia	46	10		15	11		20	32	1	9	2	3			1			3	3	
5. Pleurisy	5	2		4	1			1									1			
6. Congestion of the Lungs	5	3		6	2		1	1		2					1					
7. Asthma and Emphysema	7				7		1	5												
8. Other Diseases of Respiratory System																				
Total	79	72		75	76		54	92	5	21	4	1			2		3	3	4	5
VI. DIGESTIVE SYSTEM.																				
1. Ulcer of the Stomach		3					2	1										1		1
2. Other Diseases of Stomach (cancer excepted)	8	5		10	2	1	5	8										1	2	
3. Infantile Diarrhœa and Cholera Infantum	25	12		35			3			29	6									
4. Diarrhœa and Enteritis (not infantile)	7	7		13	1		9	4	1			2				1			1	
5. Dysentery	1				1			1												
6. Hernia and Intestinal obstructions	7	6		6	1		5	5							1			2		
7. Other Diseases of the Intestines	3			1	2		2	1		1										
8. Diseases of the Liver	4	6			7		2	7	1										1	
9. Peritonitis (not puerperal)	3	6		7	2		4	5				1					1	2	1	
10. Iliac Abscess and Appendicitis	7	6		12	1		8	5				1	1			1	1	2	2	1
Total	63	18		90	20	1	72	37	2	30	6	4	1	3	4	2	2	8	7	2
VII. GENITO-URINARY SYSTEM.																				
1. Acute Nephritis	3	2		2	3		2	3												
2. Bright's Disease	11	18		13	15	1	5	22	2			1			1		1		1	1
3. Other Diseases of Kidneys and Adnexa	11	4		8	7			15										1		
4. Vesical Calculi																				
5. Diseases of the Bladder	3	2			5			5												
6. Diseases of the Male Genital Organs																				
7. Metritis																				
8. Other Diseases of the Uterus																				
9. Ovarian Cysts and other Ovarian Tumors																				
10. Other Diseases of Female Genital Organs		1			1			1												
Total	28	27		23	31	1	7	40	2			1			1		1	1	1	1

Number of Column.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																					
1. Pericarditis					1				1								1				2
2. Endocarditis													1	1						1	3
3. Organic Heart Diseases			3	16	27	22	8	1	7	11	8	10	5	3	3	3	10	7	8	5	80
4. Angina Pectoris				2		1	1									1		2	1		4
5. Arteries, Atheroma, Aneurism, etc					3	4			1		1		1	1			1	1	2		8
6. Other Diseases of Circulatory System															1						1
Total			3	12	31	27	9	1	9	11	9	10	7	5	4	4	12	10	11	6	98
V. RESPIRATORY SYSTEM																					
1. Acute Bronchitis			2	1	3	11	7		7	5	4	7	3	1	1	1	2	1	1	1	31
2. Chronic Bronchitis					2	2	1			1	1					1		1	1	1	6
3. Broncho-pneumonia					1	1			2	1	1									1	5
4. Pneumonia	1	3	1	10	18	15	7		12	18	11	9	9		5		3	2	6	8	86
5. Pleurisy	1			1	1	1					2		2					1			5
6. Congestion of the Lungs						4	1		2	2			1				2			1	8
7. Asthma and Emphysema					5	3	1				1	2				2		1		1	7
8. Other Diseases of Respiratory System																					
Total	2	3	8	12	28	37	17		25	27	23	18	15	1	6	4	7	6	8	13	151
VI. DIGESTIVE SYSTEM.																					
1. Ulcer of the Stomach						1			1						1					1	3
2. Other Diseases of Stomach (cancer excepted)	1			1	[illegible]	1	1		1	1	2	2	1		1	4	1				13
3. Infantile Diarrhœa and Cholera Infantum									1		1	1		2	2	7	14	5	1	1	35
4. Diarrhœa and Enteritis (not infantile)	1			2			1					1	1	1	1	4	1	1		1	14
5. Dysentery						1												1			1
6. Hernia and Intestinal obstructions		1			2	3	1			1	1		1		1	1	4		1		10
7. Other Diseases of the Intestines						1	1			1					1			1			3
8. Diseases of the Liver	1		1	1	2	3	1			1	2	1					1	4		1	10
9. Peritonitis (not puerperal)	1			1	2					1	3	1					1	1		2	9
10. Iliac Abscess and Appendicitis	3	1							1	1	2	1		2	2	3			1		13
Total	7	2	1	5	9	13	5		4	6	11	7	3	5	9	19	22	16	3	6	111
VII. GENITO-URINARY SYSTEM.																					
1. Acute Nephritis		1	2		1			1		1		1			1				1	1	5
2. Bright's Disease	1	2		6	5	6	4		1	3	2	2	2	1	3	2	3	4	3	3	29
3. Other Diseases of Kidneys and Adnexa		1		2	1	5	5		1	3	1	2			2		1	3	1	1	15
4. Vesical Calculi																					
5. Diseases of the Bladder					1	3	1		1		1			1	1			1			5
6. Diseases of the Male Genital Organs																					
7. Metritis																					
8. Other Diseases of the Uterus																					
9. Ovarian Cysts and other Ovarian Tumors																					
10. Other Diseases of Female Genital Organs	1										1										1
Total	2	4	2	8	8	14	10	1	3	7	6	5	2	2	7	2	4	8	5	4	55

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions		2		1	1			2											2																	1		1			2
3. Other accidents of Pregnancy sudden death		4		3	1			4											3			1										1	1		1				1		4
Total		6		4	2			6											5			1										1	1		1	1		1	1		6
IX. THE SKIN																																									
1. Erysipelas	4	3		4	3		1	6															2	2		1	2			1	4		1							1	7
2. Skin and Adnexa (cancer excepted)	1	1			2			2															1			1							1						1		2
Total	5	4		4	5		1	8															3	2		2	2			1	4		2						1	1	9
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified Disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	31	20		54			54			54																			6	7	6	3	5	3	2	2	4	7	7	2	54
2. Congenital Debility and Malformations	54	36		90			90			90																			6	9	6	12	7	8	6	5	11	6	6	8	90
3. Other Diseases of Infancy	6	1		7			7			4	2	1																			1	1			3	1	1				7
4. Senile Decay	109	79		47	158	3	22	160	6																8	71	109		21	16	19	23	13	11	7	15	15	16	15	14	188
Total	203	136		198	138	3	173	160	6	148	2	1													8	71	109		36	32	32	39	25	22	18	23	31	29	28	24	339
XII. SUICIDE.																																									
1. Poison	1			1				1														1													1						1
2. Strangulation		1		1				1															1											1							1
3. Drowning		1		1				1															1																1		1
4. Firearms	3			3			1	1	1													2		1						1			1							1	3
5. Not stated	1			1				1																	1								1								1
Total	5	2		7			1	5	1													3	2	1	1					1			2	1	1				1	1	7
XIII. ACCIDENT.																																									
1. Fractures and Dislocations	7	4		4	7		2	8	1						1					1		1		1	2	1	4		2			3	1	2				2	1		11
2. Gunshot	3			2		1	2	1										1	1			1							1	1							1				3
3. Lightning		1			1		1										1																	1							1
4. Drowning	3	1		3		1	4				1		1		1				1												1	1			1			1			4
5. Railways	9			7	2		5	4							1			1	2	1	3				1				2	2		1		1	1		1			1	9
6. Burns and Scalds		2		2			2						1				1																							2	2
7. Homicide		1		1			1			1																					1										1
8. Other Accidents	15	6		14	4	3	8	12	1	1					1			1	2	2		2	1	7	2	1		1	3		2		1	2	2	1		1	2	7	21
9. Poison		1		1			1				1																													1	1
Total	37	16		34	14	5	26	25	2	2	2		2		4		2	3	6	1	3	4	1	8	5	2	4	1	8	3	4	5	2	6	4	1	2	4	3	11	53
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	3	7		2	7	1		10														1	1	1	2	2	3		1		1		2	2		1	2	1			10
2. Tumors	3	5		3	5		1	7													2	2		2	2							2	2		1	1		1		1	8
3. Other Ill-defined Causes	10	9		16	3		8	9	2	1	1				1	1				3			1	6	3	2			1		3	1	2	1	2		3	1	2	3	19
4. Heart Failure	11	7		10	8		8	9	1								1	1				2	1	3	9	1			3	2	1	1	1	1	3	2	1	1	1	1	18
Total	27	28		31	23	1	17	35	3	1	1				1	1	1	1		3	2	5	3	12	16	5	3		5	2	5	4	7	4	6	4	6	4	3	5	55
Total from all causes	791	636		917	498	12	599	775	53	243	38	16	11	12	25	20	26	43	56	56	42	50	57	113	176	236	197	10	136	139	159	139	115	81	92	107	122	114	104	119	1427

CAUSES OF DEATHS BY COUNTIES IN 1904.—MUSKOKA.—(Including municipalities of all classes).

General Diseases.	Sex. Male.	Female	Not stated.	Nativity. Canadian.	Foreign.	Not stated.	Social Con. Single	Married.	Not stated.	Ages. Under 5. 1.0	1	2	3	4	5-9.	10-14.	15-19.	20-24.	25-29.	30-34	35-39.	40-44	45-49.	50-59	60-69	70-79.	80 and over.	Not given	Months. January.	February.	March.	April	May.	June.	July.	August.	September	October.	November.	December	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	3	1		3	1		2	2							1			1					1	1												1	2		1		4
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	1	1		2			2			1	1																											1		1	2
5. Whooping Cough																																									
6. Diphtheria and Croup	2			2			2				1	1																	1	1											2
7. Influenza	3	1		1	3		2	2		1												1		1			1			4											4
8. Other Epidemic Diseases																																									
Total	9	3		8	4		8	4		2	2	1			1			1				1	1	2			1		1	5						1	2	1	1	1	12
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1	1		2			1	1				1															1					1	1								2
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	18	15		25	5	3	14	18	1								1	9	9	4	1	2	2	2	1			2	4	1	1	1	5	3	3	4	2	4	2	3	33
4. Syphilis																																									
5. Cancer	6	4		4	1	2		9	1													1	1	2	2	4				1	2	1			2		1		1	2	10
6. Rheumatism and Gout	2	3		2	3		1	4								1					2				1	1				2					1		2				5
7. Diabetes	2	1		2	1		1	2								1								1	1				1							1				1	3
8. Other General Diseases		1		1			1												1											1											1
9. Alcoholism, Acute and Chronic																																									
Total	29	25		36	13	5	18	34	2			1				2	1	9	10	4	3	3	3	5	5	5	1	2	5	5	3	3	6	3	6	5	5	4	3	6	54
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis		3		3			2	1							2										1				2		1										3
2. Simple Meningitis	2	1		3			3			1				1	1															1	1									1	3
3. Epidemic Cerebro-spinal Meningitis	1	1		2			2			1					1																					1			1		2
4. Congestion and Hemorrhage of Brain	5	2		4	3			7																2	4	1					1		1		3	1	1				7
5. Softening of the Brain																																									
6. Paralysis without specified cause	3	1		1	3			4																1		1	2						1		1		1		1		4
7. Insanity		1		1				1										1															1								1
8. Epilepsy	2			1	1		2					1						1																2							2
9. Convulsions (not puerperal)	3	7		10			10			8		1			1														2	3			2	1		1		1			10
10. Other Nervous Diseases	1	2		2		1		3														1			1	1					1				1			1			3
Total	17	18	....	27	7	1	19	16	....	10	..	2	..	1	5	..	..	2	..	..	..	1	..	3	6	3	2	..	4	4	4	..	5	3	5	3	2	2	2	1	35

IV.—CIRCULATORY SYSTEM																																									
1. Pericarditis		1		1				1											1											1											1
2. Endocarditis		1		1			1								1																			1							1
3. Organic Heart Diseases	7	7		8	3	3	1	13								1					1	2	1	1	3	5			2		1	1	1	2			2		1	1	11
4. Angina Pectoris	2			2				2															1		1					1	1										2
5. Arteries, Atheroma, Aneurism, etc.	1				1			1																		1														1	1
6. Other Diseases of Circulatory System																																									
Total	10	9		12	4	3	2	17							1	1			1		1	2	2	1	4	6			2	2	2	1	1	5			2		1	2	19
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	4	1		4	1		1	1		1																1						1	1	1		1	1				5
2. Chronic Bronchitis																																									
3. Broncho-pneumonia	1	1		2			2			1															1				1				1								2
4. Pneumonia	12	9		15	5	1	11	9	1	2	2		1					3		2	2		1	1	1	1	2		5	2	2	5	1		1		1	2	1	1	31
5. Pleurisy																																									
6. Congestion of the Lungs, including pul. apop.																																									
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	17	11		21	6	1	17	10	1	7	2		1					3		2	2		1	1	2	2	2		6	2	2	6	3	1	1	1	2	2	1	1	28
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach		1		1			1			1																									1						1
2. Other Diseases of Stomach (cancer excepted)	1	1			2			2													1					1							1	1							2
3. Infantile Diarrhoea and Cholera Infantum	8	5		13			13			10	2			1																			2	1	1	1	1	1			13
4. Diarrhœa and Enteritis (not infantile)	2	1		2		1	1	2														2				1				1						1		1			3
5. Dysentery																																									
6. Hernia and Intestinal obstructions	1			1			1												1										1												1
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	1					1		1																	1												1				1
9. Peritonitis (not puerperal)	1	3		1			2	2								1	1								1		1					1		2		1					4
10. Iliac Abscess and Appendicitis																																									
Total	11	11		21	2	2	18	7		11	2			1		1	1		1		1	2			2	2	1		1	1		1	3	4	2	6	5	2			25
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease																																									
3. Other Diseases of Kidneys and Adnexa	3	1		2	2			1												1						3				1	1					1			1		4
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	3	1		2	2			4												1						3				1	1					1			1		4
VIII. PUERPERAL DISEASES.																																									
1. Peurperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other Accidents of Pregnancy, sudden death		1		4				4											1	2	1								2		1						1				4
4. Puerperal Disease of the Breast																																									
Total		4		4				4											1	2	1								2		1						1				4

MUSKOKA.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas		1			1			1																		1									1						1
2. Skin and Adnexa (cancer excepted)																																									
Total		1			1			1																		1									1						1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	11	13	1	25			25			25																			1	1	2	2	2	2	2	4	4	2	2	1	25
2. Congen. Debil. and Malformations	13	12		25			25			21	1																		1	1	3	2	3	7	2	1	1	2	1	1	25
3. Other Diseases of Infancy	1			1			1				1																					1									1
4. Senile Decay	11	4		3	12			15																		6	9		1	2	1	2		2	1	1		1		4	15
Total	36	29	1	51	12		51	15		49	2															6	9		3	4	6	7	5	11	5	6	5	5	3	6	66
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation	1			1				1																1														1			1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms	1				1			1																	1										1						1
Total	2			1	1			2																1	1										1			1			2
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lightning																																									
4. Drowning	5			4		1	4	1									1	1	1			1		1								3		1	1						5
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	2			1	1		1	1										1					1						1	1											2
8. Burns and Scalds		1		1			1			1																				1											1
9. Homicide																																									
10. Other accidents	8			5	1	2	4	4								1		1				1		2		1		2	2	2			1	1	1					1	8
11. Poison		2		2			2							1	1															2											2
Total	15	3		13	2	3	12	6		1				1	1	1	1	3	1			2	1	3		1		2	3	6		3	1	2	2					1	18
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy		2		1		1		2																2						1									1		2
2. Tumors		2		1	1			2												1				1														2			2
3. Other Ill Defined Causes	1	2		2	1			3											1						1	1						1		1				1			3
4. Heart Failure	3	3		4	2		1	5										1			1			1	3					1			1	2	1			1			6
Total	4	9		8	4	1	1	12										1	1	1	1			4	4	1				2		1	1	3	1			4	1		13
Total from all causes	156	124	1	107	58	16	146	132	3	80	8	4	1	3	8	5	3	19	15	10	9	11	8	23	24	30	16	4	27	32	19	22	25	30	24	23	23	22	16	18	281

CAUSES OF DEATHS BY COUNTIES IN 1904.—NIPISSING.—(Including municipalities of all classes).

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada	Nativity. Foreign.	Nativity. Not stated.	Social con. Single.	Social con. Married.	Social con. Not stated.	Ages. Under 5. 0, 1	1.	2.	3.	4.	5–9.	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 and over.	Not given.	Months. January	February.	March.	April.	May.	June.	July.	August	September	October	November.	December.	Totals.
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	24	3		15	10	2	19	4	4		1			1			4	5	7	4		3	1		1				1				3	4	1	3	3	7	3	2	27
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	1	1		2			2					1				1														1	1										2
5. Whooping Cough	3	4		8			8			2	2	1		1	2																		1	1	1		1	3		1	8
6. Diphtheria and Croup	8	9		16	1		16	1		2	2	3	2	2	3	1	1						1						1	2	2					1		1	5	2	17
7. Influenza		4		3	1		2	2		1	1													1		1					3									1	4
8. Other Epidemic Diseases																																									
Total	36	22		44	12	2	47	7	4	5	6	5	2	4	5	2	5	5	7	4		3	2	1	1	1			5	3	6		4	5	2	4	4	11	8	7	58
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	4		6			2	1			1							3	4				1						2		2					1			1		6
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	15	6		20	1		13	8			1	1					6	4	2	1		1	2	2		1			1	1			5	3	2	1	2	1	3	2	21
4. Syphilis																																									
5. Cancer	3	2		2	3			5												1					2	2				1			1				2		1		5
6. Rheumatism and Gout	1	6		6	1		2	5					1				1							2		3			2			1							1	3	7
7. Diabetes																																									
8. Other General Diseases																																									
9. Alcoholism, Acute and Chronic	1			1				1														1																		1	1
Total	22	18		35	5		17	23			2	1	1				7	7	3	2		2	3	4	2	6			5	2	2	4	6	3	2	2	1	1	6	6	40
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2			2			1	1							1									1									1			1					2
2. Simple Meningitis	1	1		2			1		1		1														1							1	1								2
3. Epidemic Cerebro-spinal Meningitis		1		1			1			1																									1						1
4. Congestion and Hemorrhage of the Brain	2			1		1		2												1	1											1				1					2
5. Softening of the Brain																																									
6. Paralysis without specified cause	3	1		2	2			3	1													1	1			2									1	1	1	1			4
7. Insanity	1	1		1	1			2															1	1											1				1		2
8. Epilepsy																																									
9. Convulsions (not puerperal)	9	2		11			11			10		1																	2			2	1	2	1	1	1	1			11
10. Other Nervous Diseases	3	1		3	1		3	1					1		1											2			1	1	1		1								4
Total	21	7		23	4	1	17	9	2	11	1	1	1		2					1	1	1	2	2	1	4			3	1	1	1	1	2	4	1	2	2	1		28

NIPISSING.—*Continued.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis		1		1				1																	1												1				1
3. Organic Heart Diseases	10	8		12	5	1	5	12	1				1			1	1	1	1		1		3	6					1		2	1	3	3			1	3	2	2	18
4. Angina Pectoris																																									
5. Diseases of Arteries, Atheroma, Aneurism, etc.	1			1			1										1																					1			1
6. Other Diseases of Circulatory System	1			1			1												1										1												1
Total	12	9		15	5	1	7	13	1				1			1	2	1	2		1		3	6	1	5			2		2	1	3	3			2	4	2	2	21
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	5	5		8	2		7	3		5	1				1						1				2				2	2	2	1							2	1	10
2. Chronic Bronchitis																																									
3. Broncho Pneumonia	6	3		8	1		8	1		3	3	1						1					1						1	3		1	1				2		1		9
4. Pneumonia	9	3		10	2		9	3		4	1				1			1						4		1			3	2	1	1					1		1	3	12
5. Pleurisy	2	1		3			2		1			1					1		1														1	1					1		3
6. Congestion of the lungs (inc. pul. apoplexy)	3	5		7	1		7		1	2	2	1				1	1						1						1	1		1		1	1	1	1	1			8
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	25	17		36	6		33	7	2	14	7	3			2	1	2	2	1		1		2	4	2	1			7	8	3	4	2	2	1	1	4	1	5	4	42
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Dis's. of the Stomach (cancer excepted)		2		1	1			2											1	1											2										2
3. Infan. Diarr. and Cholera Infantum	7	7	1	15			15			13	1	1																	1	1				1	2	6	2	1	1		15
4. Diarrhoea and Enteritis (not Infantile)	3			3			1	2									1				1			1									1		2						3
5. Dysentery																																									
6. Hernia and Intestinal obstructions	4			2	2		1	2	1									2						2							1	1						1		1	4
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver		1		1				1																			1		1												1
9. Peritonitis (not puerperal)	3	3		2	2	2	3	3			1							3	1			1								2				1	1		1	1			6
10. Iliac Abscess and Appendicitis	2	1		2	1		2	1								1	1							1													1	2			3
Total	19	14	1	26	6	2	22	11	1	13	2	1				1	2	5	2	1	1	1		4			1		2	3	3	1	1	2	5	6	4	5	1	1	34
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis		1		1				1											1												1										1
2. Bright's Disease		1		1				1													1									1											1
3. Other Diseases of Kidneys and Adnexa	1				1			1																	1				1												1
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	1	2		2	1			3											1		1				1				1	1	1										3

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions		2		2				2										1	1														1				1				2
3. Other Accidents of Pregnancy, sudden death		9		6	1	2		9											3	1			2						1	2	1		3				1		1		9
4. Puerperal Disease of the Breast																																									
Total		11		8	1	2		11										1	1	4			2						1	2	1		4				2		1		11
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints		1		1				1															1										1								1
3. Amputation for unspecified Diseases																																									
Total		1		1				1															1										1								1
XI. MALFORMATIONS, ETC.																																									
1. Still Births	23	11	2	36			36			36																			2	7	4	3	2	5	2	5		2	4		136
2. Congenital Debility and Malformations	75	58		113			113			111	2																		11	8	9	4	12	6	6	16	15	8	8	10	13
3. Other Diseases of Infancy	11	1		18			18			5	3	5	1	3	1															5		4		1	2		2	2	1	1	18
4. Senile Decay	11	9		11	5	4	7	16																	5	8	10		3	1	7	3	2	1	3	1		1	1		23
Total	120	62	2	181	5	1	171	16		152	5	5	1	3	1										5	8	10		16	21	20	14	16	13	15	22	17	13	14	11	190
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	3			1	2				1									1										2			1								1	1	3
2. Gunshot	2					2		2														1		1							1	1									2
3. Lightning																																									
4. Drowning	6	1		6	1		5	1	1			1			1		2	2	1													1	1	1	1	2					7
5. Asphyxiation	1			1				1													1															1					1
6. Bicycles																																									
7. Railways	6	1		5	2		6	2	2								1		1	2				3							1		2	1	1			2			7
8. Burns and Scalds	3	2		5			5			1	1			1	1	1																				1				4	5
9. Homicide																																									
10. Other Accidents	22			8	11	3	5	9							1			2	2	9		1	3	2				2	1	2	1	1	1		8	1	4		1	2	22
Total	13	4		26	16	5	21	13	13	1	1	1		1	5	1	3	5	4	11	1	2	3	6				2	1	2	4	3	4	2	10	5	4	3	2	7	47
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	3			2		1		3															1	1			1											1	1	1	3
2. Tumors	1				1			1																		1					1										1
3. Other Ill defined Causes	4	7		8	2	1	4	6	1				1			1	1	2		1		1		2	2				1			1		1	2	2		2		2	11
4. Heart Failure	9	3		10	2		3	9											2	2		1	2	1	1				1	3	1	2			1			1	1	2	12
Total	17	10		20	5	2	7	19	1				1			1	1	2	2	3		2	3	7	3	1	1		2	3	2	3		1	3	2		4	2	5	27
Total from all causes	322	177	3	417	66	19	345	133	24	196	24	17	7	8	13	7	22	28	26	26	6	11	21	34	16	24	12	4	45	46	46	31	45	33	40	46	43	43	42	43	502

CAUSES OF DEATHS BY COUNTIES IN 1904.—NORFOLK.—(Including municipalities of all classes).

General Diseases.	Sex. Male	Sex. Female	Sex. Not stated.	Nativity. Canada	Nativity. Foreign.	Nativity. Not stated.	Social cond. Single	Social cond. Married.	Social cond. Not stated.	Ages. Under 5. 0-1	1-	2-	3-	4-	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months. Jan	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	6	3		8	1		4	4	1						1		2			1	1	1		1	2					2						1	4	1	1		9
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	4			4			4			1		1		2															1						1					2	4
5. Whooping Cough																																									
6. Diphtheria and Croup		2		2			2								2															2											2
7. Influenza	1	5		5	1		2	3	1													1			1	1	3		1	3	2										6
8. Other Epidemic Diseases																																									
Total	11	10		19	2		10	9	2	1		1		2	3		2			1	1	2		1	3	1	3		2	7	2				1	1	4	1	1	2	21
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	3			3				3														1			1	1				2								1			3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	7	11		20	1		9	10	2								2	1	2	7	2	3	2	1	1				3	3		2		4	2	1		1	2		21
4. Syphilis																																									
5. Cancer	9	15		19	4	1	1	22	1												2	2	1	3	6	8	2		2	1	2	2	6	1	3	4		1	1	1	24
6. Rheumatism and Gout	4			4			1	2	1						1					1						1	1								2		1		1		4
7. Diabetes	4			4			1		3							1		1						1		1					1			1				2			4
8. Other General Diseases	2	2		3	1			3	1								1		1						1		1						1		1		1		1		4
9. Alcoholism, Acute and Chronic	2			2			2															2							2												2
Total	31	31		55	6	1	11	10	8						1	1	3	2	3	8	4	8	3	5	9	11	4		7	6	3	4	7	6	8	8	2	5	5	1	62
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis		2		1		1	1	1							1							1															1	1			2
2. Simple Meningitis	3	3		5		1	6			3	1				2																2	1		1			1	1			6
3. Epidemic Cerebro-spinal Meningitis	1			1			1			1																							1								1
4. Congestion and Hemorrhage of Brain	7	5		10	2		4	7	1		1													1	4	5	1		1	1	2			1	1	1	2	2		1	12
5. Softening of the Brain		1		1				1																			1				1										1
6. Paralysis without specified cause	8	8		11	5		2	14																1	2	7	6		3	3	2	2	1	1	1	2		1			16
7. Insanity																																									
8. Epilepsy	2	1		3			3											2						1														1		2	3
9. Convulsions (not puerperal)	3	1		4			4			3		1																	1					2				1			4
10. Other Nervous Diseases	2	1		1	2			3															1		1	1					1				1	1					3
Total	26	22		37	9	2	21	26	1	7	2	1			3			2				1	1	3	7	13	8		5	4	8	3	2	5	3	4	4	7		3	48

IV. CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	15	12		22	5		3	23	1						1			2	1	1	1		1	1	6	7	5	1	3		2	2	2	3	3	2		5	3	2	27
4. Angina Pectoris																																									
5. Diseases of Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of the Circulatory System																																									
Total	15	12		22	5		3	23	1						1			2	1	1	1		1	1	6	7	5	1	3		2	2	2	3	3	2		5	3	2	27
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	1	2		3			1	2															1				2			1			1					1			3
2. Chronic Bronchitis	2			1	1			2																		1	1					1					1				2
3. Broncho-pneumonia	2	3		5			3	2		3													1		1						1				1				3		5
4. Pneumonia	12	18		25	5		11	18	1	5	1				1	2					1	1	3	2		7	7		2	9	6	1	2	1			1			5	30
5. Pleurisy		1		1			1						1																1												1
6. Congestion of the Lungs (inc. pul. apoplexy)	3	1		3	1		1	3		2															1	1					1		1						1	1	4
7. Asthma and Emphysema	1				1				1													1																1			1
8. Other Diseases of the Respiratory System	1			1				1																		1						1									1
Total	22	25		39	8		17	28	2	10	1		1		1	2					1	2	5	2	2	10	10		3	10	8	6	1	1	1		2	2	4	6	47
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the Stomach		2		1	1			2																	1	1			1	1											2
2. Other Dis's. of the Stomach (Cancer excepted)	3	1		3	1		1	2	1															3		1						1					1		1	1	4
3. Infant. Diarr. and Cholera Infantum	3	1		4			4			4																						2					2				4
4. Diarrhoea and Enteritis (not infantile)	1	2		2	1		2	1		1														1		1							1		1	1					3
5. Dysentery		1			1			1																		1												1			1
6. Hernia and Intestinal obstructions	2	2		3	1			4																		2	2				2	1				1					4
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	4	1		5			1	3	1											2				1	1	1				1			1	1			1		1		5
9. Peritonitis (not puerperal)	3	2		5			3	2		1							1							2			1		1			1			1		1		1		5
10. Iliac Abscess and Appendicitis	3	1		2	1	1	2	2								1			1				1			1			1						1		1	1			4
Total	19	13		25	6	1	13	17	2	6						1	1		1	2			1	7	2	8	3		3	2	2	5	2	1	3	2	6	2	3	1	32
VII. GENITO URINARY SYSTEM																																									
1. Acute Nephritis	3	3		1	2			6																	3	1	2				2	1		1	1				1		6
2. Bright's Disease	5	4		8	1		2	6	1									1					1	1	3	3					1		2	1	2	3					9
3. Other Diseases of the Kidneys and Adnexa	1	1		2				2														1		1									1	1							2
4. Vesical Calculi	1			1					1															1															1		1
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	10	8		15	3		2	14	2									1				1	1	3	6	4	2				3	1	3	3	3	3			2		18
VIII. PUERPERAL DISEASES																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other Accidents of Pregnancy, sudden death		1		1				1															1									1									1
4. Puerperal Disease of the Breast																																									
Total		1		1				1															1									1									1

NORFOLK.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10
IX. THE SKIN.										
1. Erysipelas	2	1		2	1			3		
2. Skin and Adnexa (cancer excepted)										
Total	2	1	...	2	1			3		
X. LOCOMOTOR SYSTEM.										
1. Pott's Disease										
2. Disease of Bones and Joints										
3. Amputation (for unspecified disease)										
Total										
XI. MALFORMATIONS, ETC.										
1. Still Births	9	7		16			16			16
2. Congenital Debility and Malformations	20	9		29			29			29
3. Other Diseases of Infancy	1			1			1			1
4. Senile Decay	38	35		38	32	3	6	61	3	
Total	68	51		81	32	3	52	64	3	46
XII. SUICIDE.										
1. Poison	1			1			1			
2. Strangulation										
3. Gas Poisoning										
4. Drowning										
5. Firearms										
6. Other Methods	2	1		1	2			2	1	
Total	3	1		2	2		1	2	1	
XIII. ACCIDENT.										
1. Fractures and Dislocations										
2. Gunshot										
3. Lightning	1			1				1		
4. Drowning										
5. Electric Cars										
6. Railways	3			3				3		
7. Burns and Scalds	2	1		3			2	1		
8. Homicide										
9. Other Accidents	9	2		9	2		4	7		
10. Poison	1			1			1			
Total	16	3		17	2		7	12		
XIV. ILL DEFINED CAUSES.										
1. Dropsy		5		2	3			5		
2. Tumors	2			2				2		
3. Other Ill-Defined Causes	5	1		7	1	1	1	8		
4. Heart Failure	2	2		1			1	3		
Total	9	11		15	4	1	2	18		
Total from all causes	**232**	**189**	...	**333**	**80**	**8**	**142**	**257**	**22**	**70**

Number of Column	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																															
1. Erysipelas														1			2		1			2									3
2. Skin and Adnexa (cancer excepted)																															
Total														1			2		1			2									3
X. LOCOMOTOR SYSTEM.																															
1. Pott's Disease																															
2. Disease of Bones and Joints																															
3. Amputation (for unspecified disease)																															
Total																															
XI. MALFORMATIONS, ETC.																															
1. Still Births																				1	1	1	4	1	2			1	3	2	16
2. Congenital Debility and Malformations																			5		3	3	1	1	2	3	3	4	2	2	29
3. Other Diseases of Infancy																					1										1
4. Senile Decay															2	19	51	1	6	8	8	8	6	6	8	4	2	4	9	4	73
Total															2	19	51	1	11	9	13	12	11	8	12	7	5	9	14	8	119
XII. SUICIDE.																															
1. Poison											1													1							1
2. Strangulation																															
3. Gas Poisoning																															
4. Drowning																															
5. Firearms																															
6. Other Methods														2		1							1					2			3
Total											1			2		1							1	1				[illegible]			4
XIII. ACCIDENT.																															
1. Fractures and Dislocations																															
2. Gunshot																															
3. Lightning											1															1					1
4. Drowning																															
5. Electric Cars																															
6. Railways								1			1			1						1	1		1								3
7. Burns and Scalds	1							1	1																	2			1		3
8. Homicide																															
9. Other Accidents					2		1	1					1		3	1	2		1	1	2	2		1			1		2	1	11
10. Poison																1											1				1
Total	1				2		1	3	1		2		1	1	3	2	2		1	2	3	2	1	1		3	2		3	1	19
XIV. ILL DEFINED CAUSES.																															
1. Dropsy														1	2	1	1			1		1		1	1					1	5
2. Tumors														1		1					1	1									2
3. Other Ill-Defined Causes											1		3	1	2	2						2	1	1		2	1		2		9
4. Heart Failure													1	1	2					1		1		1				1			4
Total											1		4	4	6	4	1			2	1	5	1	3	1	2	1	1	2	1	20
Total from all causes	**4**	**2**	**1**	**2**	**11**	**4**	**7**	**10**	**6**	**12**	**12**	**13**	**18**	**30**	**46**	**80**	**91**	**2**	**36**	**42**	**45**	**43**	**34**	**32**	**35**	**32**	**42**	**34**	**37**	**25**	**421**

CAUSES OF DEATHS BY COUNTIES IN 1904.—NORTHUMBERLAND AND DURHAM.—(Including municipalities of all classes).

General Diseases.	Sex. Male.	Female.	Not stated	Nativity. Canada.	Foreign.	Not stated.	Social Con. Single.	Married.	Not stated.	Ages. Under 5: 0-1	1-2	2-3	3-4	4-5	5-9.	10-14	15-19	20-24.	25-29.	30-34	35-39.	40-44.	45-49.	50-59.	60-69.	70-79	80 and over.	Not given.	Months. Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	3	4		7			4	2	1						2			1			1		1	1	1				2	1			1			1		1	1		7
2. Smallpox		1		1			1						1																								1				1
3. Measles	2			2			2			2																									1	1					2
4. Scarlet Fever	1	1		2			2			1			1																	1									1		2
5. Whooping Cough																																									
6. Diphtheria and Croup	4	5		9			9			1	1		1	1	2	1		1	1												1	2					1	2	1	2	9
7. Influenza	8	5		9	1		3	10		1	1						1		1	1			2		1	1	1		3	6	3									1	13
8. Other Epidemic Diseases																																									
Total	18	16		30	1		21	12	1	5	2		3	1	1	1	1	2	2	1	1		3	1	2	1	4		5	8	4	2	1		1	2	2	3	3	3	34
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia		4		1			1	2	1									1		1				2						1				1					1	1	1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	27	31		50	5	3	26	30	2						1	1	7	7	5	10	5	5	1	5	1	2		2	12	4	6	6	5	5	1	2	1	5	5	5	58
4. Syphilis																																									
5. Cancer	13	19		22	10		5	25	2										1			5	1	11	6	5	1	2	4	4	4	2	1	4	1	2	5		1	1	32
6. Rheumatism and Gout		5		3	7		4	6	1							1					1			1	4	3			1	1		1	1	1	3	1				1	10
7. Diabetes	7	3		7	3		2	8													1		1	2	3	2	1		1	3	1								1	1	10
8. Other General Diseases	5	11		15	1		2	14				1							2	1	2		3	1	2	1			1	3		2		2	1	1	2		3	1	16
9. Alcoholism, Acute and Chronic	1			1				1																1												1					1
Total	58	73		102	26	3	39	86	6			1			1	2	7	8	8	12	9	10	9	26	19	13	2	4	19	16	11	11	7	11	9	7	8	5	17	10	131
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2	1		3			1	2		1								1		1									1									1	1		3
2. Simple Meningitis	4	2		6			6			1	2				2					1									1	2			1				1			1	6
3. Epidemic Cerebro-spinal Meningitis		1		1			1				1																				1										1
4. Congestion and Hemorrhage of Brain	21	17		19	19		4	31	3		1					1						4	3	1	5	12	10	1		2	6	5	3	2	3	2	2	3	7	3	38
5. Softening of the Brain	2	5		2	5			6	1											1					1	1	1			1	1	1		1	2			1			7
6. Paralysis without specified cause	10	15		11	13	1	2	23															1	1	3	11	9		2	3	1	1	3	4			2	2	2	5	25
7. Insanity		1			1			1																		1												1			1
8. Epilepsy	1				1			1																		1							1								1
9. Convulsions (not puerperal)	12	5		17			15	2		12	1			1	1		1						1							2	3		1	1		2	1	2	1	1	17
10. Other Nervous Diseases	1	5		5	1		2	4											1	2				2		1				1			2	2				1			6
Total	53	52		64	10	1	31	70	1	11	5			1	3	1	1	1	1	5		1	5	4	9	27	23	1	4	11	12	10	11	10	5	1	6	11	11	10	105

NORTHUMBERLAND AND DURHAM.—*Continued.*

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis		1		1				1																1							1										1
3. Organic Heart Disease	20	32		28	23	1	9	10	3							1	1	1		1	1	1	2	7	12	17	8		5	5	3	7	6	2	2	7	5	5	5		52
4. Angina Pectoris	2			2				2																1	1					1	1										2
5. Diseases of Arteries, Atheroma, Aneurism, etc.	4	4		5	3		1	6	1		1													1	1	3	2			3	1	1		1	1		1				8
6. Other Diseases of the Circulatory System																																									
Total	26	37		36	26	1	10	19	4		1					1	1	1		1	1	1	2	10	14	20	10		5	9	6	8	6	3	3	7	6	5	5		63
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	6	5		5	6		3	8		3														2		4	1	1	3		1						1		2	4	11
2. Chronic Bronchitis	2	2		2	2		1	3																1		3						2	1						1		4
3. Broncho-pneumonia		3		2	1		1	2		1	1															1							1					1	1		3
4. Pneumonia	18	18		29	7		15	20	1	5	2				2			2					2	4	6	9	4		2	6	5	7	3		1		1	2	2	8	36
5. Pleurisy	4	3		5	2		2	4	1									2				1		1	1	2					1	1	1	1				1	1		7
6. Congestion of the Lungs, (inc. pul. apoplexy)	3			2	1		3				1						1									1							2					1			3
7. Asthma and Emphysema	3	1		1	3		1	3																	1	3						1					2			1	4
8. Other Diseases of the Respiratory System																																									
Total	36	32		46	22		26	40	2	9	4				2		1	1				1	2	8	8	23	5	1	5	6	7	11	8	1	1		4	5	7	13	68
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1			1				1																	1												1				1
2. Other Diseases of Stomach (cancer excepted)	6	3		4	4	1	2	7								1								2	3	3			1		1					1		3	2	1	9
3. Infantile Diarrhœa and Cholera Infantum	5	5		10			10			10																									1	5	2	1		1	10
4. Diarrhœa and Enteritis (not infantile)	3	1		3	1		2	2												1	1					2			1		1	1						1			4
5. Dysentery																																									
6. Hernia and Intestinal obstructions	3	4		4	2	1	1	6							1							1			1	3	1				1				2	1	2	1			7
7. Other Diseases of the Intestines		2		1	1		1	1								1											1			1							1				2
8. Diseases of the Liver	4	5		5	4		1	7	1															1	4	2	1	1			2	1	2			1	2			1	9
9. Peritonitis (not puerperal)	4	8		7	5		2	10							1		1	1			2	2		4				1	1	1	2		1	3	1	1		2			12
10. Iliac Abscess and Appendicitis	5	4		9			7	2							2	1	1			3		1			1				2	1			1	1	2	1				1	9
Total	31	32		44	17	2	26	36	1	10					4	3	2	1		4	3	1		7	10	10	3	2	5	3	7	2	4	1	6	10	8	8	2	4	63
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	2	4		3	3		1	5													3					1	2			1	2			1		1			1		6
2. Bright's Disease	4	8		6	5	1	1	10	1							1			1		2			2	2	3	1		2	1	2		2	1	1	1	2				12
3. Other Diseases of the Kidneys and Adnexa	4			2	2		1	3														1				1	2		1					1		1			1		4
4. Vesical Calculi																																									
5. Diseases of the Bladder	1			1				1																		1										1					1
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs		2		2				2											1	1										1	1										2
Total	11	14		14	10	1	3	21	1							1			2	1	5	1		2	2	6	5		3	3	5		2	3	1	4	2		2		25

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		2		2				2										1			1													1					1		2
2. Puerperal Albuminuria and Convulsions		2		2				2											2												1		1								2
3. Other Accidents of Pregnancy, sudden death		4		3	1			4										1	2			1							1	1	1				1						4
4. Puerperal Disease of the Breast																																									
Total		8		7	1			8										2	4		1	1							1	1	2		1	1	1				1		8
IX. THE SKIN.																																									
1. Erysipelas	2	2		1	3		1	3										1								3				2		2									4
2. Skin and Adnexa (cancer excepted)		1		1				1																1														1			1
Total	2	3		2	3		1	1										1						1		3				2		2						1			5
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease	1			1				1																	1													1			1
2. Diseases of Bones and Joints	1			1			1											1														1									1
3. Amputation for unspecified Diseases																																									
Total	2			2			1	1										1							1							1						1			2
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	20	13	2	35			35			35																			1	3	4	1	2	7	2	1	2	4	3	2	35
2. Congenital Debility and Malformations	31	22		56			56			56																			5	6	6	1	5	4	5	6	5	5	3	2	56
3. Other Diseases of Infancy	4	2		6			6			3	3																			1	1	1	1					2			6
4. Senile Decay	92	87		43	135	1	11	167	1																7	54	118		16	19	13	17	17	16	7	9	15	12	20	18	179
Total	150	124	2	140	135	1	108	167	1	91	3														7	54	118		22	29	24	26	25	27	14	16	22	23	26	22	276
XII. SUICIDE.																																									
1. Poison		1		1			1										1														1										1
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Other Methods	1			1			1																		1													1			1
Total	1	1		2			2										1								1						1							1			2
XIII. ACCIDENT.																																									
1. Fractures and Dislocations	1	1		1	1			2																			1	1	1			1									2
2. Gunshot	1			1			1										1																1								1
3. Lightning		1		1			1										1																	1							1
4. Drowning	5	1		5	1		6				1	1				1		1	2													1	1	2				1		1	6
5. Tetanus	1			1			1													1																1					1
6. Asphyxiated	1			1				1																		1												1			1
7. Railways	3			1	2		1	1	1											1				1		1									1	1		1			3
8. Burns and Scalds	1	1		2			2					1							1										2												2
9. Poison		1		1			1																1																	1	1
10. Other accidents	3	1		2	2		2	2										1						1	1	1									1		1		1	1	4
Total	16	6		16	6		15	6	1		1	2				1	2	2	3	2			1	2	1	3	1	1	3			2	2	3	2	2	1	3	1	3	22
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	1	1		2	3		1	1																	1	3	1		2	1				1			1				5
2. Tumors	3	1		3	1			4														1		1	2						3							1			4
3. Other Ill-defined Causes	6	7		11	1	1	3	7	3									2		1	1			2	3	1		3		2	2	1	2	1	1			3	1		13
4. Heart Failure	10	8		16	2		6	11	1									3			2		5	4	3			1	1	2		3	3	2	2	1	1	2	1		18
Total	23	17		32	7	1	10	26	4									5	1	3	1	5	7	9	4		1	1	3	5	5	4	5	4	3	1	2	6	2		40
Total from all causes	427	415	2	537	297	10	293	526	25	132	16	3	3	2	14	10	16	28	20	27	23	23	27	68	83	164	172	13	75	93	84	79	72	67	46	53	61	72	77	65	842

CAUSES OF DEATHS BY COUNTIES IN 1904.—ONTARIO.—(Including municipalities of all classes.)

General Diseases.	Sex. Male.	Female.	Not stated.	Nativity. Canada	Foreign.	Not stated	Social Con. Single.	Married.	Not stated	Ages. Under 5. 0-1	1	2	3	4	5-9.	10-14	15-19.	20-24	25-29	30-34	35-39.	40-44	45-49	50-59	60-69.	70-79.	80 and over	Not given	Months. January.	February	March.	April	May	June	July.	August	September	October	November	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	5	4		9			8	1				1			1	2	1	1	2							1						1			1	1	1	2	3		9
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	1		3			3					1		1					1													1								2	3
5. Whooping Cough																																									
6. Diphtheria and Croup	2	2		4			4							1	1		1				1								1								1	1	1		4
7. Influenza	5	7		5	7		1	11						1											1	6	4		8	2			1							1	12
8. Other Epidemic Diseases																																									
Total	14	14		21	7		16	12				2		3	2	2	2	1	3		1				1	7	4		9	2		2	1		1	1	2	3	4	3	28
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1			1			1			1																					1										1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	31	24		45	10		26	28	1		1	1			2		4	10	11	4	3	4	2	1	4	3	2		1	6	5	5	4	5	3	5	3	8	5	7	55
4. Syphilis																																									
5. Cancer	8	11		11	7	1	1	18									1						1	3	8	2	4			2	2	1	1	1		1	2	5	2	2	19
6. Rheumatism and Gout	4	1		4	1		3	2							1		1				1			1			1		1	1		1		2							5
7. Diabetes	1	3		4			1	3														2			2				1		1			1				1			4
8. Other General Diseases	1	8		6	3		1	8		1								1	1			1	1	2	2					2	3	1	1			1			1		9
9. Alcoholism, Acute and Chronic	1			1				1													1																			1	1
Total	47	47		72	21	1	33	60	1	2	1	1			3		6	11	12	4	5	7	4	10	16	5	7		3	11	12	8	6	9	3	7	5	14	6	10	91
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1			1				1																		1							1								1
2. Simple Meningitis	3	3		5	1		5	1		2	1	1				1										1				2		2				1		1			6
3. Epidemic Cerebro-spinal Meningitis	1			1			1			1																										1					1
4. Congestion and Hemorrhage of the Brain	12	15		12	14	1	7	18	2						1									1	4	11	10		3	2	4	1	4	1	3	3	1	2	2	1	27
5. Softening of the Brain	2	2		2	2			3	1											1				1	1	1					1				1		1			1	4
6. Paralysis without specified cause	4	4		4	4		2	6				1												2	3	1	1				2			2	2	1	1				8
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	2	3		5			5			5																								2	1		1		1		5
10. Other Nervous Diseases	1	1		1	1		1		1											1						1				1								1			2
Total	26	28		31	22	1	21	29	4	8	1	2			1	1				2				4	8	16	11		3	5	7	3	5	5	7	6	4	4	3	2	54

IV. CIRCULATORY SYSTEM.																																								
1. Pericarditis																																								
2. Endocarditis	3			3			1	2										1			1			1				1					1					1		3
3. Organic Heart Diseases	16	11		17	10		3	24														2		4	5	13	3	6		1	3	5	1	2	2	2	3	1	1	27
4. Angina Pectoris	2	1		1	2			3															2			1				1	1					1				3
5. Arteries, Atheroma, Aneurism, etc.	1	1			2			2																			2				1								1	2
6. Other Diseases of Circulatory System																																								
Total	22	13		21	14		4	31										1			1	2	2	5	5	14	5	7		2	5	5	2	2	2	3	3	2	2	35
V. RESPIRATORY SYSTEM.																																								
1. Acute Bronchitis	5	6		10		1	8	3		5							1			1				1	2		1			1	2	2	2		1		2	1		11
2. Chronic Bronchitis	3	3		2	1		1	5		1													1	1	1	1	1		2	1		1		1				1		6
3. Broncho-pneumonia	1	6		6	3	1	7	3		5														1		1	3	2		1	1		1	1					4	10
4. Pneumonia	16	14		18	11	1	9	20	1	3	1							1		3		1	2	3	4	8	4	8	2	1	3	2	1		1	3	2	1	3	30
5. Pleurisy		1		1				1													1										1									1
6. Congestion of the Lungs	3			3			3			1	1										1								1		1			1						3
7. Asthma and Emphysema																																								
8. Other Diseases of Respiratory System																																								
Total	31	30		40	18	3	28	32	1	15	2						1	1		4	2	1	3	6	7	10	9	10	5	4	8	5	4	3	2	3	4	6	7	61
VI. DIGESTIVE SYSTEM.																																								
1. Ulcer of the Stomach																																								
2. Other Diseases of Stomach (cancer excepted)	5	1		5	1		2	4											1				1		3	1					1	1		1	1	1			1	6
3. Infan. Diarrhoea and Cholera Infantum	6	7		13			13			13																						1		1	2	3	2	1		13
4. Diarrhoea and Enteritis (not infantile)		3		2	1		2	1								1			1						1									1			1		1	3
5. Dysentery																																								
6. Hernia and Intestinal obstructions	1	3		3	1		1	3					1												1	1	1						1				1	1	1	4
7. Other Diseases of the Intestines	1	2		1	2			3																1		2			2		1									3
8. Diseases of the Liver		1		1				1																		1				1										1
9. Peritonitis (not puerperal)	5	4		5	4		[illegible]	4							1	1	1		1	1					1	2	1		1		1	1			1	3	1		1	9
10. Iliac Abscess and Appendicitis	2	2		3	1		3	1								2	1			1								1		1					1	1				4
Total	20	23		33	10		26	17		13			1		1	4	2		3	2			1	1	6	7	2	1	3	2	3	3	1	6	5	8	5	2	4	43
VII. GENITO-URINARY SYSTEM.																																								
1. Acute Nephritis	6	1		5	2		2	5											1	1					1	4				1	1		1					1	3	7
2. Bright's Disease	5	8		6	6	1	2	10	1										2		2	1			2	5	1			3	3		1		1	1	2		2	13
3. Other Diseases of Kidneys and Adnexa	2			1	1			2																		2						1				1				2
4. Vesical Calculi																																								
5. Diseases of the Bladder	1				1			1																	1						1									1
6. Diseases of the Male Genital Organs																																								
7. Metritis																																								
8. Other Diseases of the Uterus																																								
9. Ovarian Cysts and other Ovarian Tumors																																								
10. Other Diseases of the Female Genital Organs																																								
Total	14	9		12	10	1	4	18	1										3	1	2	1			4	11	1			4	5	1	2		1	2	2	1	5	23
VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicæmia																																								
2. Puerperal Albuminuria and Convulsions		1		1				1												1																			1	1
3. Other accidents of Pregnancy, sudden death		1		1				1												1															1					1
4. Puerperal Disease of the Breast																																								
Total		2						2												2															1				1	2

ONTARIO.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	2			1	1			2																	1		1		2												2
2. Skin and Adnexa (cancer excepted)		1		1				1														1									1										1
Total	2	1		2	1			3														1			1		1		2		1										3
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified Disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	14	8		22			22			22																			1	2	1	1	2		5	3	2	1	2	2	22
2. Congen. Debil. and Malformations	21	12	2	38			38			38																			2	4	5	1	2	3	3		3	1	7	4	38
3. Other Diseases of Infancy	1			1			1				1																			1											1
4. Senile Decay	38	34		11	56	2	5	69																	1	21	50		13	7	4	6	5	8	4	2	2	9	6	6	72
Total	77	54	2	75	56	2	64	69		60	1														1	21	50		16	14	10	11	9	11	12	5	7	11	15	12	133
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation	1			1				1																1							1										1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total	1			1				1																1							1										1
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	3	1		3	1		2	2			1					1						1					1		1						1			1		1	4
2. Gunshot																																									
3. Lightning																																									
4. Drowning	3	1		4			4					1						1			1	1											3			1					4
5. Electric Cars																																									
6. Railways	1				1			1																																	
7. Burns and Scalds		3		3			2	1				2								1																	1				1
8. Homicide																			1											1	1								1		3
9. Other accidents	3	4		5	2		2	5		1	1											1			1	3			1	3				1		1		1			7
Total	10	9		15	1		10	9		1	2	3				1		1	1	1	1	3			1	3	1		2	1	1		3	1	1	2	1	2	1	1	19
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	2			1	1			2																1			1		1					1							2
2. Tumors	2	6		5	3		1	7															1	3	1	3			1						1	1	1	1	1	2	8
3. Other Ill-Defined Causes	3	7		5	5		5	5		1					1					1	1			3	2	1				1	1		2	1		1	1				10
4. Heart Failure	5	5		9	1		4	6											3	2	1		2	1	1				2		1	1	2	1	2	1					10
Total	12	18		20	10		10	20		1					1				3	3	2		3	8	4	4	1		4	1	2	1	4	3	3	6	2	1	1	2	30
Total from all causes.	276	248	2	345	173	8	216	303	7	100	7	8	1	3	8	8	11	15	25	19	14	15	13	35	54	98	91	1	57	45	46	46	42	38	38	38	37	49	41	49	526

CAUSES OF DEATHS BY COUNTIES IN 1904.—OXFORD (Including municipalities of all classes.).

	Sex.			Nativity			Social Con.			Ages. Under 5.					Ages.														Months.												
General Diseases.	Male.	Female.	Not stated	Canada.	Foreign.	Not stated	Single.	Married.	Not stated.	0.	1.	2	3.	4	5-9	10-14.	15-19.	20-24.	25-29.	30-34.	35-39	40-44	45-49	50-59.	60-69.	70-79	80 and over	Not given	January.	February	March	April	May.	June	July	August	September	October	November.	December	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever.	6	7		10	3		6	7					1					3	2	3				2	2								1				5	3	4		13
2. Smallpox																																									
3. Measles		1		1			1			1																							1								1
4. Scarlet Fever	1	5		6			6					2			4														2		2		1				1				6
5. Whooping Cough																																									
6. Diphtheria and Croup	2			2			2			1						1																		1	1						2
7. Influenza	2	5		3	4		1	6																	2	2	3		1	3	1	2									7
8. Other Epidemic Diseases																																									
Total	11	18		22	7		16	13		2		2	1		4	1		3	2	3				2	4	2	3		3	3	3	2	3	1	1		6	3	4		29
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	5	1		4	2		2	4					1								2	1				1	1				1	3		1						1	6
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	22	19		39	2		12	29			1							5	7	5	4	3	2	3	7	4			4	1	6	2	6	2	2	3	3	2	8	2	41
4. Syphilis																																									
5. Cancer	20	13		21	12		8	25							1		1		1			2	2	3	7	12	4		2	5	2	4	2	2	5	4	1	2	1	3	33
6. Rheumatism and Gout	2	3		3	2		2	3									2								1	1	1			1	1					1			1	1	5
7. Diabetes	1	3		3	1		1	3							1									1	1	1						2		1		1					4
8. Other General Diseases	5	6		9	2		5	6											1			1	2	1	5	1			1		1	2		2	1		2	1		1	11
9. Alcoholism, Acute and Chronic																																									
Total	55	45		79	21		30	70			1		1		2		3	5	9	5	6	7	6	8	21	20	6		7	7	11	13	8	8	8	6	6	5	13	8	100
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1	3		3	1		3	1			1				1								1			1				1	1				1					1	4
2. Simple Meningitis	3	3		5	1		4	2		1						2				1				2						1		1	3			1					6
3. Epidemic Cerebro-spinal Meningitis	3	1		4			4			1	1				2															1			1			1	1				4
4. Congestion and Hemorrhage of Brain	15	12		13	14		1	26											1		1		1	2	3	12	7		4	3	2	5	4		3				3	3	27
5. Softening of the Brain	3	1		3	1		1	3														1				1	2		1	1	2										4
6. Paralysis without specified cause	9	14		9	14		3	18	2													1		4	4	7	7		5	4	1	2	1	2	2	3	1	2			23
7. Insanity		1		1			1																	1																1	1
8. Epilepsy		1			1		1														1													1							1
9. Convulsions (not puerperal)	5	4		9			7	2			4		2		1							1			1				1	1	2	1	1			2		1			9
10. Other Nervous Diseases	1	2		3			2	1												2				1					1						2						3
Total	40	42		50	32		27	53	2	6	2	2			4	2			1	3	2	3	2	10	8	21	16		12	12	8	9	10	3	8	7	2	3	3	5	82

OXFORD.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Disease	21	31		27	25		12	10								2			1	1	1	1	3	9	9	17	8		1	7	5	8	2	4	2	5	5	2	7	4	52
4. Angina Pectoris	3	1		3	1		1	2	1														1	1		1	1				1					1	1			1	4
5. Arteries, Atheroma, Aneurism, etc.	3			1	2		1	2																	1	1	1				1	1		1							3
6. Other Diseases of the Circulatory System																																									
Total	27	32		31	28		14	14	1							2			1	1	1	1	4	10	10	19	10		1	7	7	9	2	5	2	6	6	2	7	5	59
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	7	3		6	4		6	4		3																3	4			1	1	5	1						2		10
2. Chronic Bronchitis		2		2				2																		2											1	1			2
3. Broncho-pneumonia	4	2		5	1		3	3		3																3			2		1			1			2				6
4. Pneumonia	27	33		11	19		20	38	2	3	2	2	1		4		2	1			2	1	3	4	14	12	9		5	16	12	2	7	1	4	1	1	1	4	6	60
5. Pleurisy	4	2		4	2			6																3	1	1	1					1	1		1	1		1	1		6
6. Congestion of the Lungs, inc. pul. apoplexy	8	3		9	2		9	2		6					2									1			2		3	2	2			3			1				11
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	50	45		67	28		38	55	2	15	2	2	1		6		2	1			2	1	3	8	15	21	16		10	19	16	8	9	5	5	2	5	3	7	6	95
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	2			1	1			2															1	1								1	1								2
2. Other Diseases of Stomach (cancer excepted)	1	2		3			3								2									1												2			1		3
3. Infantile Diarrhœa and Cholera Infantum	7	5		12			12			8	4																		1			1			1	4	3	2			12
4. Diarrhœa and Enteritis (not infantile)	2	2		3	1		4							1					2								1					3				1					1
5. Dysentery	1	1		1	1			2																	1		1		1								1				2
6. Hernia and Intestinal obstructions	4	3		6		1	2	5		1											1	1		3	1						1		3		1				1	1	7
7. Other Diseases of the Intestines	1				1		1																		1															1	1
8. Diseases of the Liver	3	3		4	2		2	4													1	1	1		1	2					1			1	1		1	2			6
9. Peritonitis (not puerperal)	3	7		8	2		4	6		2							1		3					1	2			1	1				2	2	2	1		1	1		10
10. Iliac Abscess and Appendicitis	3	3		5	1		3	3								1	1	1		1		1			1						1	1			2		2				6
Total	27	26		43	9	1	31	22		11	4			1	2	1	2	1	5	1	2	3	2	6	7	2	2	1	3		3	6	6	3	7	8	7	5	3	2	53
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	4	1		4	1		3	2									1				1			1	1	1					1				2				2		5
2. Bright's Disease	4	2		2	4		2	4													1			1	2	2				2	1				1	2					6
3. Other Diseases of Kidneys and Adnexa	5	1		3	3		2	4				1												3	1		1				2			1		1		1	1		6
4. Vesical Calculi																																									
5. Diseases of the Bladder	1	1		1	1			2																		1	1						1	1							2
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		2		1	1		1	1														1				1					1			1							2
10. Other Diseases of the Female Genital Organs																																									
Total	14	7		11	10		8	13				1					1				2	1		5	4	5	2			2	5		1	3	3	3		1	3		21

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions				2				2										1	1														1					1			2
3. Other Accidents of Pregnancy, sudden death		2		2				2										1					1									2									2
4. Puerperal Diseases of the Breast																																									
Total		1		1				1										2	1				1									2	1					1			4
IX. THE SKIN																																									
1. Erysipelas	1			3	1		2	2		2																2			1			2		1							4
2. Skin and Adnexa (cancer excepted)				1	1			2																	1	1												2			2
Total	1			4	2		2	4		2															1	3			1			2		1				2			6
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints	1			1			1											1																					1		1
3. Amputation (for unspecified disease)																																									
Total	1			1			1											1																					1		1
XI. MALFORMATIONS, ETC.																																									
1. Still Births	1	15		29			29			29																			5	2	5	2	1	2		4	3	1	2	2	29
2. Congen. Debility and Malformation	2	25	1	51			51			51																			5	2	5	4	6	5	9	3	2	5	3	2	51
3. Other Diseases of Infancy	[illegible]			3			3			2					1														1					1	1						3
4. Senile Decay	[illegible]	54		25	88		7	106																	2	31	80		12	13	8	7	11	5	15	7	5	10	8	14	113
Total	101	94	1	108	88		90	106		82					1										2	31	80		25	17	18	13	18	12	23	11	10	16	13	18	196
XII. SUICIDE																																									
1. Poison	1			1				1																	1							1									1
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total	1			1				1																	1							1									1
XIII. ACCIDENT																																									
1. Fractures and Dislocations	4			3	1		2	2											1		1			1	1						1			1			1			1	4
2. Gunshot																																									
3. Lightning	1			1			1											1															1								1
4. Drowning																																									
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	12			7	2	3	3	9										1	3	1	1			1	1			1		1							9	2			12
8. Burns and Scalds		1		1				1																	1								1								1
9. Homicide																																									
10. Other Accidents	8			5	3		2	6								1					1		1		1	2	2						2	1			1			1	8
11. Poison	1			1	1		1	1			1											1									1							1			2
Total	26	2		18	7	3	9	19			1					1		2	4	1	6	1	1	2	1	2	2			1	2		1	2		5	11	3		2	28
XIV. ILL DEFINED CAUSES																																									
1. Dropsy	1	4		2	3		3	2								1	1									1	2			1	1	1	1	1							5
2. Tumors	2			2	2		3	1							1			1	1							1			1						1	1			1		1
3. Other Ill Defined Causes	12	6		12	3		7	8		1							1		3		1	2		1	5		1		3		2	1	1		3		1	1	1		15
4. Heart Failure	12			11	4		5	10										2		1	1	1	2	6	1	1			1		1	1	2					1	2	3	15
Total	25	12		27	12		18	21		1					1	1	2	3	4	1	2	3	2	7	6	5	3		5	1	1	6	5	1	4	1	1	2	4	5	39
Total from all causes	381	332	1	466	244	4	284	425	5	119	9	8	3	1	20	8	10	18	27	15	23	20	21	56	83	129	140	2	65	69	77	71	67	45	61	50	54	46	56	51	714

CAUSES OF DEATHS BY COUNTIES IN 1904—PARRY SOUND.—(Including municipalities of all classes.)

General Diseases.	Sex			Nativity.			Social Conditions.			Ages. Under 5.																		Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over.	Not given.	January	February	March.	April.	May	June	July.	August.	September	October.	November.	December.	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES																																									
1. Typhoid Fever	3	3		5	1		4	2								1	2	2						1								1						4		1	6
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2			2			2			1		1																		1						1					2
5. Whooping Cough	2			2			2			2																						2									2
6. Diphtheria and Croup	3	3		6			6			1		1			1	3															1		1	1		1		1		1	6
7. Influenza	1	2		2	1			2	1															1	1	1				3											3
8. Other Epidemic Diseases																																									
Total	11	8		17	2		14	4	1	4		2			1	4	2	2						2	1	1				4	1	3	1	1		2		5		2	19
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia		2		2			1	1		1										1										1							1				2
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	9	16		22	2	1	12	11	2			1				1	1	8	3	2	3	1		4			1		1	5	1	1	2	3	1	1	2	5	1	2	25
4. Syphilis																																									
5. Cancer	4	5		6	3		2	5	2												1	1	2		3	2			1			2	1	1	2		1		1		9
6. Rheumatism and Gout		3		1	2			2	1					1										2									2	1							3
7. Diabetes	2	2		3	1		1	3										1					1		1	1				1		1					1		1		4
8. Other General Diseases	1	1		2				2										1					1															1	1		2
9. Alcoholism, Acute and Chronic	1			1			1													1																			1		1
Total	17	29		37	8	1	17	24	5	1		1		1		1	1	10	3	4	4	2	4	6	4	3	1		2	7	1	4	5	5	3	1	5	6	5	2	46
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	3			3			3			1	1									1									1					1			1				3
2. Simple Meningitis	2			2			2				1						1												1								1				2
3. Epidemic Cerebro-spinal Meningitis	1			1					1															1													1				1
4. Congestion and Hemorrhage of the Brain	3	2		3	1	1		3	2															2	2			1				1	1	2				1			5
5. Softening of the Brain																																									
6. Paralysis without specified cause	3	4		4	3		2	3	2															1	4	1	1		1		1	1	1			1			2		7
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	8	2		10			10			7	2				1														3	1	1					1	2	1		1	10
10. Other Nervous Diseases																																									
Total	20	8		23	4	1	17	6	5	8	4				1		1			1				4	6	1	1	1	6	1	2	2	2	3		2	5	2	2	1	28

IV. CIRCULATORY SYSTEM		
1. Pericarditis	2 2 1 1 1 1 1 2	2
2. Endocarditis	1 1 2 2 1 1 1 1	2
3. Organic Heart Diseases	2 2 3 1 1 3 1 1 1 1 2 2	4
4. Angina Pectoris		
5. Arteries, Atheroma, Aneurism, etc	1 1 1 1 2 1 1 1 1	2
6. Other Diseases of Circulatory System		
Total	6 4 6 4 2 7 1 1 1 2 1 2 3 1 1 1 4 1 2	10
V. RESPIRATORY SYSTEM		
1. Acute Bronchitis	7 5 11 1 1 10 2 9 1 1 1 1 6 3 2	12
2. Chronic Bronchitis		
3. Broncho pneumonia	3 1 4 4 3 1 1 1 1 1	4
4. Pneumonia	12 9 16 4 1 8 9 4 1 1 1 1 1 4 1 3 3 2 2 1 7 7 1 1 1 1 1 1 1	21
5. Pleurisy	2 1 1 2 1 1 2	2
6. Congestion of the Lungs, (inc. pul. apoplexy)	2 1 1 1 1 1 1 1 1	2
7. Asthma and Emphysema	1 1 1 1 1	1
8. Other Diseases of Respiratory System		
Total	27 15 33 8 1 23 15 4 23 2 1 1 1 1 1 4 1 3 1 4 4 3 1 1 9 15 2 3 1 1 1 1 4 2 3	42
VI. DIGESTIVE SYSTEM		
1. Ulcer of the Stomach	1 1 1 1 1	1
2. Other Dis's. of the Stomach (cancer excepted)	2 2 1 1 1 1 1 1	2
3. Infant. Diarr. and Cholera Infantum	1 1 5 5 5 1 1 2 1	5
4. Diarrhœa and Enteritis (not Infantile)	1 1 1 1 1	1
5. Dysentery		
6. Hernia and Intestinal obstructions	1 1 1 1 1	1
7. Other Diseases of the Intestines		
8. Diseases of the Liver	1 1 1 1 1	1
9. Peritonitis (not puerperal)	3 3 3 1 1 1 2 1	3
10. Iliac Abscess and Appendicitis	3 6 8 1 6 2 1 1 1 1 3 1 1 3 1 1 1 1 1 1	9
Total	11 12 21 2 16 4 3 5 1 2 2 5 2 1 2 2 1 4 2 1 2 1 3 2 3 1 2 1 1	23
VII. GENITO URINARY SYSTEM		
1. Acute Nephritis	2 1 3 1 1 1 1 1 1 1 2	3
2. Bright's Disease	2 1 2 1 6 1 1 1 1 1 1	3
3. Other Diseases of Kidneys and Adnexa		
4. Vesical Calculi		
5. Diseases of the Bladder	5 1 2 3 1 1 1 1 1 1	3
6. Diseases of the Male Genital Organs		
7. Metritis		
8. Other Diseases of the Uterus		
9. Ovarian Cysts and other Ovarian Tumors		
10. Other Diseases of the Female Genital Organs		
Total	7 2 6 3 1 7 1 1 2 1 1 2 1 1 1 2 2 4	9
VIII. PUERPERAL DISEASES		
1. Puerperal Septicæmia		
2. Puerperal Albuminuria and Convulsions	2 1 1 2 1 1 1 1	2
3. Other Accidents of Pregnancy, sudden death	5 4 1 1 3 1 2 3 3 2	5
4. Puerperal Disease of the Breast		
Total	7 5 1 1 1 5 1 1 3 3 3 3 1	7

PARRY SOUND.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN																																									
1. Erysipelas	1				1			1																		1							1								1
2. Skin and Adnexa (cancer excepted)																																									
Total	1				1			1																		1							1								1
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation for unspecified Diseases																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	11	5	1	17			17			17																			1	2			1	3	1		2	1	1	1	17
2. Congen. Debil. and Malformations	17	13		30			30			30																			1	2	1	4	3	2	4	3	4		1	5	30
3. Other diseases of Infancy	2	2		1			1			2	1	1																	1				1	1	1						4
4. Senile Decay	16	7		9	14		2	20	1																1	11	11		1	2	3	4	2	1			2	1	6	1	23
Total	46	27	1	60	14		53	20	1	49	1	1													1	11	11		7	6	4	8	7	7	6	3	8	2	9	7	74
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XII. ACCIDENTS.																																									
1. Fractures and Dislocations	2				1	1	1	1													1				1									1						1	2
2. Gunshot	3			1	2			3												1				1	1									1		1			1		3
3. Lightning																																									
4. Drowning	10	1		6	1	4	10	1				1				2		1	1	1		1		1									2	2		1	2		3	1	11
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	2				2		1	1									1				1												1					1			2
8. Burns and Scalds		1		1			1								1															1											1
9. Homicide																																									
10. Other accidents	10			5	5		3	2	5						1			2	3		1			2			1		2				2					5		1	10
Total	27	2		13	11	5	16	8	5			1			2	2	1	6	4	2	3	1		4	2		1		2	1			5	4		2	2	6	4	3	29
XIV. ILL-DEFINED CAUSES																																									
1. Dropsy		4		2	1	1	1	3															1	1	1	1			1	1								1		1	4
2. Tumors		3		3				3														2		1						1		1				1					3
3. Other Ill-defined Causes	3	5		5	3		2	6									1					1	1	1	3	1				3	1				1		1	1	1		8
4. Heart Failure	6	2		8			5	3							3			1	1					2	1				1			3			1	2			1		8
Total	9	14		18	4	1	8	15							3		1	1	1			3	2	5	5	2			2	5	1	4			2	3	1	3	2	1	23
Total from all causes	182	128	1	239	60	12	168	116	27	80	8	6	2	1	10	11	11	24	15	12	12	9	9	29	28	26	16	2	33	42	12	25	32	27	17	21	23	29	25	25	311

CAUSES OF DEATHS BY COUNTIES IN 1904.—PEEL.—(Including municipalities of all classes).

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Soc'l con. Single.	Soc'l con. Married.	Soc'l con. Not stated.	Ages. Under 5. 0.	1.	2.	3.	4.	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 & over.	Not given.	Months. January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever																																									
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	4			4			4			1	1		1		1															1								1			2	4
5. Whooping Cough																																									
6. Diphtheria and Croup	4	3		7			7					1		1	4	1													1		1	2	1		2						7
7. Influenza	1	5		3	2	1	1	5		1									1						1		3		3	2		1									6
8. Other Epidemic Diseases																																									
Total	9	8		14	2	1	12	5		2	1	1	1	1	5	1			1						1		3		4	3	1	3	1		2		1			2	17
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1				1				1																1															1	1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	13	15		22	5	1	12	10	6						1	2	2	1	7	2		1	1	4	7				6	1	1	6	3	2	2	1		5	1		28
4. Syphilis																																									
5. Cancer	4	7		10	1			10	1													1		5	5				2			1	2	1	2	1		1	1		11
6. Rheumatism and Gout	1			1			1								1																									1	1
7. Diabetes	3	5		7		1	2	5	1								1	2						5					1	1	2	2						1		1	8
8. Other General Diseases	3	1		2	2		1	2	1								1							1	2				1		1				2						4
9. Alcoholism, Acute and Chronic																																									
Total	25	28		42	9	2	16	27	10						2	2	4	3	7	2		2	1	15	15				10	2	4	9	5	3	6	2		7	2	3	53
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	1			1			1										1																							1	1
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	4	3		4	3		2	4	1														1	2		4			1	2			1		1			2			7
5. Softening of the Brain		1		1			1																		1							1									1
6. Paralysis without specified cause	7	8		4	10	1	3	10	2															1	2	6	6		2	1		3	1		2	1	1	3		1	15
7. Insanity		3		2		1		3															2		1							1		1					1		3
8. Epilepsy	1				1				1									1																	1						1
9. Convulsions (not puerperal)	2	5		7			6	1		1	1	1								1									2		1				1			2	1		7
10. Other Nervous Diseases	3			1	2			1	2										2						1										2					1	3
Total	18	20		20	16	2	13	19	6	4	1	1					1	1	2	1			3	3	5	10	6		5	3	1	5	2	1	7	1	1	7	2	3	38

PEEL.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	6	12		13	5		2	11	5								1	1	4		1			1	3	6	1		3	1	2	4		1	2	2		1	1	1	18
4. Angina Pectoris	1	1		2			1		1															2												1		1			2
5. Arteries, Atheroma, Aneurism, etc.	2	2		2	2			3	1																	1	3										1		3		4
6. Other Diseases of Circulatory System																																									
Total	9	15		17	7		3	14	7								1	1	4		1			3	3	7	4		3	1	2	4		1	2	3	1	2	4	1	24
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	2			2			1		1	1														1								1							1		2
2. Chronic Bronchitis		1		1			1			1																			1												1
3. Broncho pneumonia	2	4		4	2		2	3	1	3																2	1		1				1	1				1	1	1	6
4. Pneumonia	7	8		12	3		7	7	1	1		1	1				1	1	2				1	1	3	2	1		6	2	2	1	1					1	1	1	15
5. Pleurisy																																									
6. Congestion of the Lungs																																									
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	11	13		19	5		11	10	3	6		1	1				1	1	2				1	2	3	4	2		8	2	2	2	2	1				2	3	2	24
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	1			1				1																		1										1					1
3. Infantile Diarrhœa and Cholera Infantum	3	5		8			8			8																					1					2	3	1		1	8
4. Diarrhœa and Enteritis (not infantile)																																									
5. Dysentery																																									
6. Hernia and Intestinal obstructions	2				2			2																		2				2											2
7. Other Diseases of the Intestines	1			1			1										1																							1	1
8. Diseases of the Liver	3	1		2	2			2	2																2	2			1			1				2					4
9. Peritonitis (not Puerperal)	2	3		5			2	2	1		1				1						1	1				1				3		1			1						5
10. Iliac Abscess and Appendicitis	1	1		2			1	1											1			1											1							1	2
Total	13	10		19	4		12	8	3	8	1				1		1		1		1	2			2	6			1	5	1	2	1		1	5	3	1		3	23
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	7	6		8	5		3	10									1	1						2	2	4	2	1				1	3	2			2		2	3	13
3. Other Diseases of Kidneys and Adnexa		2		1	1			2												1					1							1								1	2
4. Vesical Calculi																																									
5. Diseases of the Bladder	1			1				1																		1											1				1
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the female Genital Organs																																									
Total	8	8		10	6		3	13									1	1		1				2	3	5	2	1				2	3	2			3		2	4	16

VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicaemia		1	1				1										1																		1					1
2. Puerperal Albuminuria and Convulsions		2	2				2											1			1									1								1		2
3. Other accidents of Pregnancy, sudden death		1	1				1													1														1						1
4. Puerperal Disease of the Breast																																								
Total		4	4				4										1	1		1	1									1				1	1			1		4
IX. THE SKIN																																								
1. Erysipelas																																								
2. Skin and Adnexa (cancer excepted)																																								
Total																																								
X. LOCOMOTOR SYSTEM																																								
1. Pott's Disease																																								
2. Diseases of the Bones and Joints																																								
3. Amputation (for unspecified diseases)																																								
Total																																								
XI. MALFORMATIONS, ETC.																																								
1. Still-births	1	2	6			6			6																				1		1					2		1	1	6
2. Congen. Debility and Malformations	7	10	17			17			17																			1	1	1	3				5	1		3	2	17
3. Other Diseases of Infancy																																								
4. Senile decay	17	31	20	28		3	45																		13	35		5	10	4	5	4	4		4	2	4	3	3	48
Total	25	43	43	28		26	45		23																13	35		6	12	5	9	4	4		9	5	4	7	6	71
XII. SUICIDE																																								
1. Poison																																								
2. Strangulation																																								
3. Gas Poisoning																																								
4. Drowning																																								
5. Firearms																																								
6. Other methods	2			2			2																		2						1				1					2
Total	2			2			2																		2						1				1					2
XIII. ACCIDENTS.																																								
1. Fractures and Dislocations	3		3				3								1				1		1											1			1			1		3
2. Gunshot	1		1			1											1																				1			1
3. Lightning																																								
4. Drowning	1		1			1											1																	1						1
5. Electric Cars																																								
6. Bicycles																																								
7. Railways																																								
8. Burns and Scalds																																								
9. Homicide																																								
10. Other accidents	4		2	2		1	3									1								1	2						1		1	1	1					4
Total	9		7	2		3	6								1	1	2		1		1			1	2						1	1	1	2	2		1	1		9
XIV. ILL DEFINED CAUSES.																																								
1. Dropsy		1	1				1																1																1	1
2. Tumors		1		1			1																			1								1						1
3. Other Ill-defined Causes	1	1	2			1	1								1										1											1	1			2
4. Heart Failure	1	2		3			3																	3							1	2								3
Total	2	5	3	4		1	6								1								1	3	1	1					1	2		1		1	1		1	7
Total from all causes	134	154	198	85	5	100	159	29	43	3	3	2	1	8	5	10	10	18	5	3	6	5	26	36	50	53	1	37	28	17	39	21	13	22	24	15	25	22	25	288

CAUSES OF DEATHS BY COUNTIES IN 1904—PERTH.—(Including municipalities of all classes.

General Diseases.	Sex. Male	Sex. Female	Sex. Not stated	Nativity. Canada	Nativity. Foreign	Nativity. Not stated	Soc'l con. Single	Soc'l con. Married	Soc'l con. Not stated	Ages. Under 5: 0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over	Not given	Months. Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES																																									
1. Typhoid Fever	4	4		8			2	6										1	2		3	1	1						1			1		1		2	1	2			8
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever		1		1			1					1																									1				1
5. Whooping Cough	1	2		3			3			3																					1		2								3
6. Diphtheria and Croup	2	2		4			4			1		1		1	1																1	1	1		1						4
7. Influenza		1			1			1																			1			1											1
8. Other Epidemic Diseases																																									
Total	7	10		16	1		10	7		4		2		1	1			1	2		3	1	1				1		1	1	2	2	3	1	1	2	2	2			17
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia	1	2		2	1		2	1			1				1											1											1		2		3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	26	19		36	9		28	17			1				2	1	4	5	9	7	1	4	1	5	3	2			3	6	5	2	4	2	1	1	1	6	5	5	45
4. Syphilis																																									
5. Cancer	19	20		14	24	1	13	25	1			1			1				1	1			1	7	10	13	1		5	4	2	2	1	3		2	5	6	4	5	39
6. Rheumatism and Gout	1				1			1																		1							1								1
7. Diabetes	1	5		5	1		3	3				1				2						1			2					2				1	1			2			6
8. Other General Diseases	5	10		11	4		2	13								1		1		2	1	3	2	2	2	1				1	5			2	2		1	3	1		15
9. Alcoholism, Acute and Chronic	1			1				1														1																	1		1
Total	54	56		69	40	1	48	61	1		2	2			4	4	4	6	10	10	2	9	4	11	17	18	1		8	13	10	4	8	8	7	6	8	17	13	8	110
Local Diseases																																									
III. NERVOUS SYSTEM																																									
1. Encephalitis	2	2		3	1		1	3		1											1	1	1											1	1	1				1	4
2. Simple Meningitis	6	6		11		1	11		1	7	1			2					1					1							1		2	4	1				1	3	12
3. Epidemic Cerebro-spinal Meningitis	1			1			1			1																								1							1
4. Congestion and Hemorrhage of Brain	12	11		7	16		3	20														2		2	2	7	10		2	5	1	3	2	3			1		1	2	23
5. Softening of the Brain	2			1	1			2															1				1		1										1		2
6. Paralysis without specified cause	11	4		6	9		2	13										1							7	7			1	1	2			1	3	2	1	2	1	1	15
7. Insanity		1		1				1													1																		1		1
8. Epilepsy	1				1			1																		1														1	1
9. Convulsions (not puerperal)	2	2		4			4	0		4																					1		1	1					1		4
10. Other Nervous Diseases	3	1		4			2	2				1								1			1	1								1			1		2				4
Total	40	27		38	28	1	24	42	1	13	1	1		2				1	1	1	2	3	3	4	9	15	11		4	6	5	4	5	11	6	3	4	2	9	8	67

IV. CIRCULATORY SYSTEM.											
1. Pericarditis	...	...	...	...	...	...	...	...	...		
2. Endocarditis	4	1	...	2	3	...	2	3	..	1 1 1 1 1 1 1 1 1 1 1	5
3. Organic Heart Diseases	22	15	...	14	23	...	6	30	1	2 1 3 1 1 3 8 2 6 3 8 6 3 5 1 2 2 2 1 4	37
4. Angina Pectoris	1	...	...	...	1	...	..	1	.	1 1	1
5. Arteries, Atheroma, Aneurism, etc.	3	1	..	2	2	..	..	4	..	1 1 1 1 1 1 1 1	4
6. Other Diseases of Circulatory System	..	...	..	...	...	...	...	...	...		
Total	30	17	.	18	29	.	8	38	1	2 1 4 2 2 5 8 15 8 5 9 6 4 6 1 3 3 2 2 2 1	47
V. RESPIRATORY SYSTEM											
1. Acute Bronchitis	2	6	.	6	2	...	6	.		1 1 1 2 1 2 1 1 1 2 2 1	8
2. Chronic Bronchitis	2	3		2	3	...	1	4	..	1 1 1 2 1 2 1 1	5
3. Broncho pneumonia	1	7	.	3	5	..	2	5	1	1 1 1 3 1 1 2 2 1 2 1	8
4. Pneumonia	15	18	...	20	12	1	10	21	2	4 2 3 2 1 1 3 6 8 3 4 7 2 5 2 1 1 3 5 2	
5. Pleurisy	...	...	...	...	...	...	...	...	...		
6. Congestion of the Lungs (inc. pul. apoplexy)	1	3		3	1	..	2	2	.	2 1 1 1 1 1 1	4
7. Asthma and Emphysema	...	...	...	...	...	...	...	...	...		
8. Other Diseases of Respiratory System	...	...	...	...	...	...	...	...	...		
Total	21	37		34	23	1	21	34	3	9 2 4 1 1 4 3 1 1 6 12 13 1 1 9 12 4 5 5 1 1 1 4 8 4	58
VI. DIGESTIVE SYSTEM											
1. Ulcer of the Stomach	..	2	.	1	1	...	1	1	..	1 1 1 1	2
2. Other Diseases of Stomach (cancer excepted)	2	3	...	...	5	...	1	4	..	1 2 1 1 2 1 1 1	5
3. Infant. Diarr. and Gastro Ent. (cholera infan.)	5	1	...	6	...		6	...	...	6 1 2 2 1	6
4. Diarrhoea and Enteritis (not infantile)	1	2	...	3		..	3	..	...	1 2 1 1 1	3
5. Dysentery	...	...	...	...	...	...	...	...	...		
6. Hernia and Intestinal obstructions	1	1	...	2	..	...	1	1	.	1 1 2	2
7. Other Diseases of the Intestines	1	.		...	1	...		1	.	1 1	1
8. Diseases of the Liver	3	4	...	5	2		..	7	..	1 1 1 1 3 1 1 1	7
9. Peritonitis (not puerperal)	5	5	...	6	4	..	1	6		1 1 1 1 2 2 1 1 2 1 2 1 1 1	10
10. Iliac Abscess and Appendicitis	2	3		4	1	..	4	1		1 1 1 1 1 1 1 1 2	5
Total	20	21		27	14	...	20	21	.	7 1 2 1 2 2 2 1 2 2 4 6 7 2 3 1 2 5 4 1 7 6 5 1 3 3	41
VII. GENITO-URINARY SYSTEM											
1. Acute Nephritis	2	1	.	1	2	...	1	2	...	1 1 1 1 1 1	3
2. Bright's Disease	8	3	...	7	4	.	3	8	...	1 1 2 2 3 2 1 2 2 2 2 1 1	11
3. Other Diseases of the Kidneys and Adnexa	2	...	..	1	1	..	1	1	.	2 1 1	2
4. Vesical Calculi	...	...	...	...	...	...	...	...	...		
5. Diseases of the Bladder	...	...	...	...	...	...	...	...	...		
6. Diseases of the Male Genital Organs	...	...	...	...	...	...	...	...	...		
7. Metritis	...	...	...	...	...	...	...	...	...		
8. Other Diseases of the Uterus	...	...	...	...	...	...	...	...	...		
9. Ovarian Cysts and other Ovarian Tumors	...	...	...	...	...	...	...	...	...		
10. Other Diseases of Female Genital Organs	...	1	..	1	..	...	1	...	.	1 1	1
Total	12	5	..	10	7	..	6	11	...	1 1 1 2 1 4 5 1 2 3 2 3 2 2 1 1	17
VIII. PUERPERAL DISEASES											
1. Puerperal septicaemia	..	3	..	3	...	..		3	.	2 1 1 2	3
2. Puerperal Albuminuria and Convul.	.	1	.	1	..		..	1	.	1 1	1
3. Other accidents of Pregnancy, sudden death	..	2		2	..			2	...	2 1 1	2
4. Puerperal Diseases of the Breast	...	...	...	...	...	...	...	...	...		
Total	...	6	...	6	...	...	...	6	...	2 2 2 1 3 1 1	6

PERTH.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints		1		1			1								1														1												1
3. Amputation (for unspecified diseases)																																									
Total		1		1			1								1														1												1
XI. MALFORMATIONS, ETC.																																									
1. Still-births	8	10	4	22			22			22																			3	3	3	3	1			2	1	3	2	1	22
2. Congen. Debility and Malformations	26	16		42			42			42																			5	1	3	3	6	6	3	2	3	7	3		42
3. Other Diseases of Infancy	1	5		6			6			6																								1	1		1	2	1		6
4. Senile Decay	39	27		4	61	1	3	62	1																3	19	44		8	7	8	3	5	4	3	6	5	3	6	8	66
Total	74	58	4	74	61	1	73	62	1	70															3	19	44		16	11	14	9	12	11	7	10	10	15	12	9	136
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation	1			1			1																	1											1						1
3. Gas Poisoning																																									
4. Drowning		1			1			1																		1											1				1
5. Firearms																																									
6. Not Stated		1		1				1											1												1										1
Total	1	2		2	1		1	2											1					1		1					1				1		1				3
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	4			2	2		1	3												1				1	1		1			1	1						1			1	4
2. Gunshot																																									
3. Lightning																																									
4. Drowning	3			2	1		2	1						1					1						1								1			1		1			3
5. Tetanus	1			1				1																			1										1				1
6. Railways																																									
7. Burns and Scalds	1			1			1				1																											1			1
8. Homicide																																									
9. Other Accidents	7	2		7	2		2	7										2	1	1		2	1		1	1			1			1	1	1		2			2	1	9
10. Poison	1			1			1			1																					1										1
Total	17	2		11	5		7	12		1	1			1				2	[illegible]	2		2	1	1	3	1	2		1	1	2	1	2	1		3	2	2	2	2	19
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	4	2		1	5		1	5											1							1	4		1			1	1		1			2			6
2. Tumors	4	1		5			3	2								1		1	1		1			1								1	1		1			2			5
3. Other Ill-defined Causes	3	4		6	1		3	4								1		1	1	1		1			2				2		3							1	1		7
4. Heart Failure	5	5		7	3		4	6									1		1	1	2	1		2	2				3	2		2		2					1		10
Total	16	12		19	9		11	17								2	1	2	4	2	3	2		3	4	1	4		6	2	5	4	[illegible]	2	2			5	2		28
Total from all causes	292	254	4	328	218	4	230	313	7	105	6	10		4	11	8	8	17	33	16	13	24	17	36	56	93	92	1	51	53	57	39	53	44	38	34	37	53	52	39	550

CAUSES OF DEATHS BY COUNTIES IN 1904.—PETERBOROUGH—(Including municipalities of all classes).

	Sex. Male	Sex. Female	Sex. Not stated	Nativity. Canada	Nativity. Foreign	Nativity. Not stated	Social Condition. Single	Social Condition. Married	Social Condition. Not stated	Ages. Under 5. 0-1	1	2	3	4	Ages. 5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months. January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
General Diseases.																																									
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Tyhoid Fever	2	6		1	1	3	1	5	2								1	1	2	1		2	1									1		5		1				1	8
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	5	1		5	1		6			1				1	2	2													5								1				6
5. Whooping Cough																																									
6. Diphtheria and Croup	9	9		18			17	1		1	2	2	2	5	2	1	1			2									3	1	2		1	2	2		1	1	2	3	18
7. Influenza	2	4		5	3		1	5				1												1	1	2	1		1	3					1			1			6
8. Other Epidemic Diseases																																									
Total	18	20		30	5	3	25	11	2	2	2	3	2	6	4	3	2	1	2	3		2	1	1	1	2	1		9	4	2	1	1	7	3	1	2	2	2	4	38
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	2		3	1		1	3								1		1	1							1			1				1	1			1				4
2. Malarial Fever		1		1			1										1																		1						1
3. Tuberculosis and Scrofula	21	33		48	5	1	35	18	1						1	3	12	13	4	6	2	4	3	1	5	1		1	4	5	5	1	6	8	2	6	1	6	2	8	54
4. Syphilis																																									
5. Cancer	4	7		8	3		1	10														1	5	1	1				2	2	2	1	1						2	1	11
6. Rheumatism and Gout	3	1		1			1	3											1					1	2				1				1					1	1		1
7. Diabetes	1	1		1	1			2														1		1										1						1	2
8. Other General Diseases	2	9		9	1	1	2	9									1		2	2			1	3		1	1			2	1		3	1	1	1			2		11
9. Alcoholism, Acute and Chronic	1			1				1																	1															1	1
Total	34	54		75	11	2	41	46	1						1	4	14	14	8	8	2	6	9	7	10	3	1	1	8	9	8	2	12	11	4	7	2	7	7	11	88
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2			2			1	1								1								1								1			1						2
2. Simple Meningitis	1	2		3			3			1			1				1												1		1			1							3
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	4	5		1	5		1	6	2										1			1		1	2	2	2		1	1		1			1		3	1		1	9
5. Softening of the Brain	1			1				1																		1							1								1
6. Paralysis without specified cause	15	6		9	11	1	4	15	2									1				1		5	5	6	3		2	4	1	1	3	1	2	2	2	1	2		21
7. Insanity	1	1		1		1	2										1	1												1									1		2
8. Epilepsy	1			1			1													1										1											1
9. Convulsions (not puerperal)	3	3		6			5	1		5														1					1		1	1			1				1	1	6
10. Other Nervous Diseases	2	1		2	1		2	1							1										1	1			1						1					1	3
Total	30	18		29	17	2	19	25	4	6			1		1	1	2	2	1	1		2		8	8	10	5		6	7	3	4	4	2	6	2	5	2	4	3	48

PETERBOROUGH.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis		1			1			1																			1										1				1
3. Organic Heart Diseases	15	12		17	9	1	4	22	1						1			1		2		1		2	11	6	3			3	4	3	3	4	2	1	1	2	1	3	27
4. Angina Pectoris	1	1		1	1			2																	2															2	2
5. Disease of Arteries, Atheroma, Aneurism, etc	1			1				1																			1									1					1
6. Other Diseases of the Circulatory System																																									
Total	17	14		19	11	1	4	26	1						1			1		2		1		2	13	6	5			3	4	3	3	4	2	2	2	2	1	5	31
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	6	6		9	3		6	6		4	1						1							2	2	2			1	1	1			1	2			1	3	2	12
2. Chronic Bronchitis		1			1			1																	1										1						1
3. Broncho-pneumonia																																									
4. Pneumonia	17	9		16	10		12	13	1	2	2					1	2	2	2	1		2		3	3	3	3		2	4	2	3	2	1			2	3	4	3	26
5. Pleurisy	3			3			1	2														1		1		1			2										1		3
6. Congestion of the Lungs (incl. pul. apoplexy)	3			2	1		2	1											1		1					1				1			1					1			3
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	29	16		30	15		21	23	1	6	3					1	3	2	3	1	1	3		6	6	7	3		5	6	3	3	3	2	3		2	5	8	5	45
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1			1			1															1													1						1
2. Other Dis's. of the Stomach (cancer excepted)	5	1		4	2		1	5			1													1	2	2			1			1		1	1	1			1		6
3. Infan. Diarr. and Cholera Infantum	5	7		12			12			10	1	1																	3			1			2	5	1				12
4. Diarrhœa and Enteritis (not infantile)	2	3		3	1	1		4	1									1						1	1	1	1		1		1					2				1	5
5. Dysentery																																									
6. Hernia and Intestinal obstructions	3	1		2	2		2	2		1			1													1	1			2					1	1					4
7. Other Diseases of the Intestines	3				3		1	1	1																1	2					1							2			3
8. Diseases of the Liver	5			5			2	3												1				1	3							2	1	1		1					5
9. Peritonitis (not puerperal)	1	1		2			1	1												1				1								1							1		2
10. Iliac Abscess and Appendicitis	2	2		4			1	3										1	1			1			1					1				1		1				1	4
Total	27	15		33	8	1	21	19	2	11	2	1	1					2	1	2		2		4	8	6	2		5	3	2	5	1	3	5	11	1	2	2	2	42
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	5	1		4	2		1	5									1				1			1	2	1				1	1	1						1		2	6
2. Bright's Disease	6	4		2	7	1	1	9										1			1			1	2	3	1	1	1	2	1	2	1			1			1	1	10
3. Other Diseases of the Kidneys and Adnexa	4	2		4	2		2	4									1					1	1		3							1		2			1	2			6
4. Vesical Calculi																																									
5. Diseases of the Bladder	1			1				1																	1														1		1
6. Diseases of the Male Genital Organs	1				1			1																	1													1			1
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs		1		1			1												1												1										1
Total	17	8		12	12	1	5	20									2	1	1		2	1	1	2	9	4	1	1	1	3	3	4	1	2		1	1	1	2	3	25
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									

2. Puerperal Albuminuria and Convulsions		4		3	1		1	3											2	1	1											1			1	1			1	4
3. Other accidents of Pregnancy, sudden death		5		3	2			5									1	1	1	1	1									1	2	1	1								5
4. Puerperal Disease of the Breast																																									
Total		9		6	3		1	8									1	1	3	2	2									1	2	2	1			1	1			1	9
IX. THE SKIN.																																									
1. Erysipelas	1			1			1																				1				1										1
2. Other Dis. of Skin and Adnexa (cancer except.)																																									
Total	1			1			1																				1				1										1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified Dis.)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-births	28	10	3	41			41			41																			1	6	6	1	1	1	3	8	7	3	2		41
2. Congen. Debility and Malformations	31	20		54			54			53		1																	1	2	6	7	6	2	3	8	8	3	4	1	51
3. Other Diseases of Infancy	1	4		5			5			3	2																							1		3				1	5
4. Senile Decay	33	30		9	54		4	58	1																	18	45		4	8	6	6	7	3	4	2	4	5	8	6	63
Total	96	61	3	109	54		104	58	1	97	2	1														18	45		9	16	18	17	17	7	10	21	15	14	14	8	163
XII. SUICIDE.																																									
1. Poison	1	1			2			2														1					1				1							1			2
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms	1			1			1																		1										1						1
6. Not stated		2		2			2									1	1													1									1		2
Total	2	3		3	2		3	2								1	1					1			1		1			1	1				1			1	1		5
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	3			2	1		1	2							1				1								1			1							1			1	6
2. Gunshot																																									
3. Lightning																																									
4. Drowning	4	2		5	1		5	1			2				1		1	1						1										3	2	1					6
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	1			1				1												1														1							1
8. Burns and Scalds	2			2				2																1				1						1	1						2
9. Homicide																																									
10. Other Accidents	9	5		9	5		3	10	1			1			1	1		1	1					4	1	1			3		1			2			1		2	5	11
11. Poison	1			1			1														1										1										1
Total	20	7		20	7		10	16	1		2	1			3	1	1	2	2	1	1			6	1	4	1	1	3	1	2			7	3	1	2		2	6	27
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	3	3		4	2		1	5														1			4	1						3	2	1							6
2. Tumors	2	2		4			2	2									1		2			1									1	1							2		4
3. Other Ill-Defined Causes	8	6		11			5	9		1	2	1						1	1		1	2		1	1				1	1	2	2	1	2		1		1	2	1	14
4. Heart Failure	1	5		6			2	1										1			1			2	2				1		1						1	3			6
Total	14	16		28	2		10	20		1	2	1					1	2	3		2	4		3	10	1			2	1	4	6	3	3		1	1	1	1	1	30
Total from all causes	305	244	3	395	147	10	265	274	13	123	13	7	4	6	10	11	27	28	24	20	10	22	11	39	67	61	66	3	48	55	53	47	46	48	37	48	34	40	47	49	552

CAUSES OF DEATHS BY COUNTIES IN 1904.—PRESCOTT AND RUSSELL.—(Including Municipalities of all Classes).

General Diseases	Sex. Male	Female	Not stated	Nativity. Canada	Foreign	Not stated	Soc'l con. Single	Married	Not stated	Ages. Under 5. 0	1	2	3	4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–59	60–69	70–79	80 and over	Not given	Months. January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	6	2		8			3	4	1		1			1	1				2	2				1					1	2	2				1			2			8
2. Smallpox																																									
3. Measles	1		1	2			2					1		1																					1					1	2
4. Scarlet Fever	2			2			2					1					1												1								1				2
5. Whooping Cough	11	9		20			20			13	4	2			1														1	2	2	3	3	3	6						20
6. Diphtheria and Croup	10	6		16			16			3	5	1	4		1	1													2	1	4	4			1	2		2			16
7. Influenza	5	4		9			7	2		4	1	1									1			1		1				1	3		2	1		1		1			9
8. Other Epidemic Diseases																																									
Total	35	21	1	57			50	6	1	30	9	6	1	2	6	1	1		2	2	1			2		1			5	6	11	7	5	4	9	3	1	5		1	57
II. OTHER GENERAL DISEASES.																																									
1. Pyæmia and Septicæmia																																									
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	21	46		65	2		25	32	10		5	4			1	1	5	17	10	4	3	5	1	7	2	1		1	12	2	9	10	8	3	6	5	5	2	3	2	67
4. Syphilis																																									
5. Cancer	12	15		22	4	1	1	23	3															13	3	7	4		3	2	2	2	2	2	4	1	1	3	1	4	27
6. Rheumatism and Gout	1			1				1																1														1			1
7. Diabetes	1	1		1	1			2																1			1										1			1	2
8. Other General Diseases		1		1				1										1													1										1
9. Alcoholism, Acute and Chronic																																									
Total	35	63		90	7	1	26	59	13		5	4			1	1	5	8	10	4	3	5	1	22	5	8	5	1	15	4	12	12	10		10	6	7	6	4	7	98
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	9	4		13			11	2		6			2		2	1										2			1	1	2	3	1	3			2				13
2. Simple Meningitis	1	3		4			4				2		1		1																1	2	1								4
3. Epidemic Cerebro-spinal Meningitis		1		1				1																1															1		1
4. Congestion and Hemorrhage of the Brain	5	5		10			2	8										1			2	1		1	1	4			1	3	2	1		1			1	1			10
5. Softening of the Brain	2	1		1		2		2	1												1			1	1				1			1						1			3
6. Paralysis without specified cause	6	10		11	5			11	2													1		1	3	5	5	1	1	2	5	1		2	1		1		2	1	16
7. Insanity																																									
8. Epilepsy	2			2			2										1					1												1	1						2
9. Convulsions (not puerperal)	1	2		3			3			1	1		1																1					1	1						3
10. Other Nervous Diseases	2	3		4	1		1	4										1							2	1	1				1	1			1			1		1	5
Total	28	29		49	6	2	23	31	3	7	3		4		3	1	1	2			3	3		4	7	12	6	1	5	6	11	9	4	9	1		4	3	3	2	57

Cause	Figures across the table (in printed order)	Total
IV. CIRCULATORY SYSTEM		
1. Pericarditis		
2. Endocarditis	2 2 1 1 3 1 1 2 2 1 1 1	4
3. Organic Heart Diseases	10 5 10 3 2 10 5 1 2 2 1 3 2 1 2 4 1 2 1 2 2 1	15
4. Angina Pectoris		
5. Arteries, Atheroma, Aneurism, etc.	1 1 1 1 1 1 1 1 1 1	2
6. Other Diseases of Circulatory System		
Total	15 8 15 3 3 2 11 5 1 1 1 1 2 3 6 3 2 1 2 2 4 1 2 1 3 2 3 1	21
V. RESPIRATORY SYSTEM		
1. Acute Bronchitis	10 3 11 2 9 3 1 5 3 1 1 2 1 1 4 2 1 1 1 1 1 1	13
2. Chronic Bronchitis		
3. Broncho-pneumonia	1 1 2 2 1 1 1 1	2
4. Pneumonia	1 9 22 2 8 14 2 1 1 2 1 2 1 2 1 1 3 6 3 3 6 5 4 2 1 1 1 1	24
5. Pleurisy		
6. Congestion of the Lungs	9 7 16 14 1 1 6 2 1 1 2 1 1 2 2 3 3 3 1 3 1	16
7. Asthma and Emphysema	1 1 1 1 1	1
8. Other Diseases of the Respiratory System		
Total	36 20 52 4 33 19 4 12 6 2 2 3 4 3 1 2 1 1 1 6 8 4 6 10 11 9 4 4 2 2 1 2 2	56
VI. DIGESTIVE SYSTEM		
1. Ulcer of the Stomach		
2. Other Diseases of Stomach (cancer excepted)	2 1 3 1 2 1 2 1 1 1	3
3. Infantile Diarrhoea and Cholera Infantum	27 20 17 17 11 4 2 2 2 2 3 5 7 9 8 3 6	47
4. Diarrhoea and Enteritis (not infantile)	5 2 6 1 1 6 1 1 1 3 1 2 1 1 2 1	7
5. Dysentery		
6. Hernia and Intestinal obstructions	1 1 1 1 1	1
7. Other Diseases of the Intestines		
8. Diseases of the Liver		
9. Peritonitis (not puerperal)	2 3 4 1 2 3 1 1 1 1 1 1 1 1 1 1	3
10. Iliac Abscess and Appendicitis	1 1 2 1 1 1 1 1 1	2
Total	37 28 63 2 52 13 12 1 2 1 2 1 1 1 1 4 5 1 4 2 2 6 6 10 14 9 4 8	65
VII. GENITO-URINARY SYSTEM		
1. Acute Nephritis	2 2 2 1 1 1 1	2
2. Bright's Disease	4 1 4 1 5 1 1 2 1 1 1 2 1	5
3. Other Diseases of Kidneys and Adnexa	5 3 6 2 2 6 1 1 1 1 1 2 1 1 1 3 2 1	8
4. Vesical Calculi		
5. Diseases of the Bladder	3 1 4 1 1 1 2 3 1	4
6. Diseases of the Male Genital Organs		
7. Metritis		
8. Other Diseases of the Uterus		
9. Ovarian Cysts and other Ovarian Tumors		
10. Other Diseases of Female Genital Organs	1 1 1 1 1	1
Total	14 6 17 3 2 18 1 2 2 1 1 1 1 2 6 3 3 2 2 1 3 3 1 2 2 1	20
VIII. PUERPERAL DISEASES		
1. Puerperal Septicaemia		
2. Puerperal Albuminuria and Convulsions		
3. Other accidents of Preg. and sudden death	6 6 6 1 1 2 1 1 1 2 1	6
4. Puerperal Diseases of the Breast		
Total	6 6 6 1 1 2 2 1 1 1 2 1	6

PRESCOTT AND RUSSELL.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	3			2	1		2	1		1			1													1			1		1					1					3
2. Skin and Adnexa (cancer excepted)		1		1				1																1														1			1
Total		1		3	1		2	2		1			1											1		1			1		1					1		1			4
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	14	10	2	26			26			26																			2	2	4	2	5	3	1	2	2		1	2	26
2. Congen. Debility and Malformations	88	83		171			171			169	2																		14	9	12	20	17	8	12	16	17	17	11	18	171
3. Other Diseases of Infancy	8	3		11			11			2	1	3																	1	1	2	3		2	1			1			11
4. Senile Decay	32	27		47	9	3	1	56	2		1														2	15	40	2	5	8	5	6	7	3	3	3	5	2	8	4	59
Total	142	123	2	255	9	3	209	56	2	197	6	3		2											2	15	40	2	22	20	23	31	29	16	17	21	24	20	20	24	267
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Not specified																																									
Total																																									
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	1			1																						1					1										1
2. Gunshot																																									
3. Lightning																																									
4. Drowning	1				1			1																		1						1									1
5. Electric Cars																																									
6. Suffocation	1			1							1																									1					1
7. Railways	1			1			1						1																						1						1
8. Burns and Scalds		1		1			1				1																													1	1
9. Homicide	2	1		3			1	2								1					1				1				2		1										3
10. Other Accidents	6			6			1	4	1						1					1	1		2					1				1			1		4				6
11. Poison		1		1			1					1																							1						1
Total	12	3		14	1		6	8	1		2	1	1		1	1				1	2		2		1	2		1	2		2	2			3	1	4			1	15
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	3	5		7	1			8															2	1	1	3	1				1	1	2		1	1			1	1	8
2. Tumors	3	1		1	3			4																1	1	2					1		2					1			4
3. Other Ill-Defined Causes	12	5		13	2	2	8	8	1	1				1		2		1	1	1	1	1	1	2	2	1	1	1	2		1	3		1	4	1	3	1	1		17
4. Heart Failure	3	6		9			1	8											1			1	1	5	1				2		1	1		2	1	1				1	9
Total	21	17		30	6	2	9	28	1	1				1		2		1	2	1	1	2	4	9	5	6	2	1	4		4	5	4	3	6	3	3	2	2	2	38
Total from all causes	376	325	3	651	42	11	414	260	30	280	35	18	13	5	14	12	13	25	18	13	15	12	12	44	38	67	63	7	65	55	83	83	66	54	60	56	55	38	40	49	704

CAUSES OF DEATHS BY COUNTIES IN 1904—PRINCE EDWARD.—(Including Municipalities of all Classes).

General Diseases.	Sex.			Nativity.			Social Condition.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign	Not stated.	Single.	Married.	Not stated.	0 1	1.	2	3.	4.	5–9.	10–14	15–19.	20–24.	25–29.	30–34.	35–39.	40–44	45–49.	50–59.	60–69.	70–79.	80 and over	Not given.	January.	February	March.	April.	May.	June.	July.	August.	September.	October.	November	December.	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	1	2		2		1	1	2							1							1			1						1							1		1	3
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	3			3			3				1			1			1															1	1							1	3
7. Influenza	1	2		2	1		1	1	1	1																	2				2							1			3
8. Other Epidemic Diseases																																									
Total	5	4		7	1	1	5	3	1	1	1			1	1		1					1			1		2				3	1	1					2		2	9
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia		2		2				2											1		1															2					2
2. Malarial Fever	1			1			1							1																								1			1
3. Tuberculosis and Scrofula	7	19		23	3		10	14	2			1					4	2	2	3	6	1	1	1	3	2				4	2	1	5	2	2		2	3	3		26
4. Syphilis																																									
5. Cancer	3	11		12	2		1	9	1												1	2	1	1	7		1	1	1	1	1	2		1	4		2	1	1		14
6. Rheumatism and Gout	1			1			1																				1							1							1
7. Diabetes	2	2		4			1	3													1		1		2							2					2				4
8. Other General Diseases	2	4		5	1		1	5							1		1						1	1	1		1					1	1	1		2				1	6
9. Alcoholism, Acute and Chronic																																									
Total	16	38		48	6		18	33	3			1		1	1		5	2	3	3	9	3	4	3	13	2	3	1	3	5	3	6	6	5	6	4	6	5	4	1	54
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis		2		1	1		2							1													1			1			1								2
2. Simple Meningitis																																									
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	4	2		3	3			5	1																1	4		1			1			1	1		1	2			6
5. Softening of the Brain		1		1				1																		1										1					1
6. Paralysis without specified cause	7	5		11	1		1	10	1								1							3	4	1	3		1				2		1	1	2	3	1	1	12
7. Insanity																																									
8. Epilepsy	1			1			1									1																		1							1
9. Convulsions (not puerperal)	1	2		3			3			3																				1		1		1							3
10. Other Nervous Diseases	2	2		4			1	3															1		1	2			1									2		1	4
Total	15	14		24	5		8	19	2	3				1		1	1						1	3	6	8	4	1	2	2	1	1	3	3	2	2	3	7	1	2	29

PRINCE EDWARD.—*Continued.*

Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. DISEASES OF CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Disease	3	10		9	4		2	9	2							1					1			1	2	6	1	1	1			2	1		2	4	1	1	1		13
4. Angina Pectoris																																									
5. Diseases of Arteries, Atheroma, Aneurism, etc																																									
6. Other Diseases of the Circulatory System																																									
Total	3	10		9	4		2	9	2							1					1			1	2	6	1	1	1			2	1		2	4	1	1	1		13
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis		1		1				1																	1															1	1
2. Chronic Bronchitis																																									
3. Broncho-pneumonia		1		1				1																			1				1										1
4. Pneumonia	4	3		5	1	1	3	3	1	2													1		2	1	1		2		1	2								2	7
5. Pleurisy																																									
6. Congestion of the Lungs inc. pul. apoplexy	1			1			1			1																								1							1
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	5	5		8	1	1	4	5	1	3													1		3	1	2		2		2	2		1						3	10
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the Stomach	2			2				2																1				1										1	1		2
2. Other Diseases of Stomach (cancer excepted)	1			1				1															1														1				1
3. Infan. Diarrhœa and Cholera Infantum	1	1		2			2			2																							1				1				2
4. Diarrhœa and Enteritis (not infantile)		1			1			1																		1							1								1
5. Dysentery																																									
6. Hernia and Intestinal obstructions	1	2		3				3											1				1			1			1		1	1									3
7. Other Diseases of the Intestines	1			1			1											1															1								1
8. Diseases of the Liver	2	1		2	1			3																	2	1				1					1	1					3
9. Peritonitis (not puerperal)		1		1			1												1												1										1
10. Iliac Abscess and Appendicitis																																									
Total	8	6		12	2		4	10		2								1	2				2	1	2	3		1	1	1	2	1	3		1	1	2	1	1		14
VII. GENITO-URINARY SYSTEM																																									
1. Acute Nephritis	1			1				1																		1						1									1
2. Bright's Disease	3	4		6	1		2	5													1	1	1		3		1				1	1	1	3		1					7
3. Other Diseases of the Kidneys and Adnexa																																									
4. Vesical Calculi																																									
5. Diseases of the Bladder	2			2			1	1																		1	1		1					1							2
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	6	4		9	1		3	7													1	1	1		3	2	2		1		1	2	1	4		1					10

VIII. PUERPERAL DISEASES.																																								
1 Puerperal Septicaemia																																								
2 Puerperal Albuminuria and Convulsions																																								
3 Other accidents of Pregnancy sudden death																																								
4 Puerperal Disease of the Breast																																								
Total																																								
IX. THE SKIN																																								
1. Erysipelas																																								
2 Skin and Adnexa (cancer excepted)																																								
X. LOCOMOTOR SYSTEM. Total																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation (for unspecified Disease)																																								
XI. MALFORMATIONS, ETC Total																																								
1 Still-Births	5	2		7			7			7																		1	1	1	3						1			7
2 Congenital Debility and Malformations	8	5		13			13			13																				3		1	1	2	1	2		2	1	13
3. Other Diseases of Infancy	1	1		2			2					2																				1				1				2
4 Senile Decay	28	29		41	15	1	2	55																5	20	31	1	6	6	7	4	8	4	3	4	4	5	3	3	57
Total	42	37		63	15	1	24	55		20		2												5	20	31	1	7	7	11	7	10	5	5	5	7	6	5	4	79
XII SUICIDE.																																								
1 Poison																																								
2 Strangulation																																								
3. Gas Poisoning																																								
4 Drowning																																								
5. Firearms																																								
6. Not stated	1			1				1																1														1		1
Total	1			1				1																1														1		1
XIII. ACCIDENT.																																								
1 Fractures and Dislocations	1			1			1									1																						1		1
2 Gunshot																																								
3 Lightning																																								
4 Drowning	1			1			1					1																							1					1
5. Electric Cars																																								
6. Bicycles																																								
7 Railways																																								
8. Burns and Scalds																																								
9. Homicide																																								
10 Other Accidents	3			3			1	2										1			1			1							1							2		3
Total	5			5			3	2				1				1		1			1			1							1				1			3		5
XIV. ILL-DEFINED CAUSES																																								
1 Dropsy		3		2	1			3															1		1	1		1						1					1	3
2. Tumors		1		1			1										1																				1			1
3 Other Ill-defined Causes		1		1				1																1				1												1
4 Heart Failure	1	1		2			1	1										1						1								1		1						2
Total	1	6		6	1		2	5									1	1					1	2	1	1		2				1		2			1		1	7
Total from all causes	107	124		192	36	3	73	149	9	29	1	4	3	2	2	8	4	7	3	11	6	9	9	39	43	46	5	19	15	23	23	26	18	18	18	19	23	16	13	231

CAUSES OF DEATH BY COUNTIES IN 1904.—RAINY RIVER.—(Including Municipalities of all Classes.)

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Soc'l con. Single.	Soc'l con. Married.	Soc'l con. Not stated.	Ages. Under 5. 0	1	2	3	4	5-9.	10-14	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49	50-59.	60-69.	70-79	80 and over	Not given	Months. January.	February	March	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	6	3	....	2	7	...	5	2	2	...							1	3	2		2							1	1	1							2	3	2		9
2. Smallpox	...	...	...	...	...	...	...	...	...	...																															......
3. Measles	....	2	...	2	....	..	2	....	....	1			1																	2											2
4. Scarlet Fever	3	2	.	5	...	....	5	....	....	...		1		1	3															1	1		1		2						5
5. Whooping Cough	...	...	...	...	...	...	...	...	...	...																															......
6. Diphtheria and Croup	8	1	..	9	...	...	7	2	...	...			1		2		1	3						1				1		1								1	4	3	9
7. Influenza	2	1	...	3	....	....	1	2	...	...					1								1			1					2		1								3
8. Other Epidemic Diseases	...	..	...	...	...	...	...	...	...	...																															......
Total	19	9	....	21	7	..	20	6	2	1		1	2	1	6	.	2	6	2	.	2	.	1	1	.	1	.	2	1	5	3	.	2		2	.	2	4	6	3	18
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	...	1	....	1	...	....	1	.	....	1																									1						1
2. Malarial Fever	...	...	...	...	...	...	...	...	...	...																															......
3. Tuberculosis and Scrofula	7	4	....	6	5	....	9	2	...				1				3	2	2	1	..	1	1						3		1					2		3	1	1	11
4. Syphilis	...	...	...	...	...	...	...	...	...	...																															......
5. Cancer	1	2	....	2	1	...	...	3	....	....											1			1			1						2							1	3
6. Rheumatism and Gout	....	1	..	....	1	..	...	1	....	....												1												1							1
7. Diabetes	1	....	....	1	....	...	1	....	....	....										1																1					1
8. Other General Diseases	....	1	....	1	....	....	....	1	....	....													1									1									1
9. Alcoholism, Acute and Chronic	1	....	....	1	....	..	...	1	....	....														1														1			1
Total	10	9	....	12	7	....	11	8	....	1	..	..	1	..	..	..	3	2	2	2	1	2	2	2	.	.	1	..	3	..	1	1	2	1	1	3	..	4	1	2	19
Local Diseases.																																									
III. DISEASES OF NERVOUS SYSTEM																																									
1. Encephalitis	...	...	....	....	....	....	....	....	...	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2. Simple Meningitis	2	...	....	2	....	....	1	1	...	....	....	....	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.	1	2
3. Epidemic Cerebro-spinal Meningitis	...	1	...	1	....	....	....	1	...	....	....	....	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
4. Congestion and Hemorrhage of Brain	1	....	....	1	....	....	1	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
5. Softening of the Brain	....	....	....	....	....	....	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......
6. Paralysis without specified cause	1	2	....	1	2	....	....	3	....	....	....	....	...	...	...	...	...	...	...	...	...	...	1	1	..	1	...	...	...	...	1	...	...	...	...	1	...	1	...	...	3
7. Insanity	....	....	....	....	....	....	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......
8. Epilepsy	....	....	....	....	....	....	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......
9. Convulsions (not puerperal)	3	1	....	4	....	....	4	....	....	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	..	1	..	..	.	1	.	..	4
10. Other Nervous Diseases	....	....	....	....	....	....	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......
Total	7	4	....	9	2	....	6	5	....	1	1	2	..	..	1	..	..	..	2	..	..	..	1	2	..	1	..	..	..	..	2	1	..	1	..	2	..	4	..	1	11

Cause	Entries (in printed order)	Total
IV. DISEASES OF CIRCULATORY SYSTEM.		
1. Pericarditis	1 1 1 1 1	1
2. Endocarditis	...	...
3. Organic Heart Diseases	1 3 2 3 1 1 1 1 1 1 1 1	4
4. Angina Pectoris	...	...
5. Arteries, Atheroma, Aneurism, etc	...	...
6. Other Diseases of Circulatory System	...	...
Total	1 4 3 2 4 1 1 1 1 1 2 1 1 1	5
V. RESPIRATORY SYSTEM.		
1. Acute Bronchitis	3 2 4 1 4 1 4 1 1 1 2 1	5
2. Chronic Bronchitis	...	...
3. Broncho-pneumonia	...	...
4. Pneumonia	7 6 8 5 7 6 1 1 1 1 2 1 1 2 2 1 1 2 3 2 1 1 1 2	13
5. Pleurisy	1 1 1 1 1	1
6. Congestion of the Lungs, inc. pul. apop.	2 2 2 1 1 1 1	2
7. Asthma and Emphysema	...	...
8. Other Diseases of Respiratory System	...	...
Total	10 11 15 5 1 13 7 1 5 1 1 1 1 1 2 1 1 2 3 1 1 2 3 5 3 2 1 1 2 2	21
VI. DIGESTIVE SYSTEM.		
1. Ulcer of the Stomach	...	...
2. Other Diseases of Stomach (cancer excepted)	...	...
3. Infan. Diarrhoea and Cholera Infantum	5 6 11 11 10 1 3 8	11
4. Diarrhoea and Enteritis (not infantile)	...	...
5. Dysentery	1 1 1 1 1	1
6. Hernia and Intestinal obstructions	...	...
7. Other Diseases of the Intestines	...	...
8. Diseases of the Liver	...	...
9. Peritonitis (not Puerperal)	...	...
10. Iliac Abscess and Appendicitis	...	...
Total	6 6 11 1 12 10 1 1 3 1 8	12
VII. GENITO-URINARY SYSTEM		
1. Acute Nephritis	...	...
2. Bright's Disease	1 1 1 1 1	1
3. Other Diseases of Kidneys and Adnexa	...	...
4. Vesical Calculi	...	...
5. Diseases of the Bladder	...	...
6. Diseases of the Male Genital Organs	...	...
7. Metritis	...	...
8. Other Diseases of the Uterus	...	...
9. Ovarian Cysts and other Ovarian Tumors	...	...
10. Other Diseases of Female Genital Organs	...	...
Total	1 1 1 1 1	1
VIII. PUERPERAL DISEASES		
1. Puerperal Septicaemia	...	...
2. Puerperal Albuminuria and Convulsions	...	...
3. Other acc. of Preg., sudden death	1 1 1 1 1	1
4. Puerperal Disease of the Breast	...	...
Total	1 1 1 1 1	1

RAINY RIVER.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1				1			1																		1								1							1
2. Skin and Adnexa (cancer excepted)																																									
Total	1				1			1																		1								1							1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	3	3		6			6			6																						2	1			2			1		6
2. Congen. Debil. and Malformations	15	5		20			20			20																			1	1	1	1	2	2	2	2	2	2	1	3	20
3. Other Diseases of Infancy	1			1			1					1																											1		1
4. Senile Decay	5	4		2	7		2	7																		5	4			2		2			1	1	3				9
Total	21	12		29	7		29	7		26		1														5	4		1	3	1	5	3	2	3	5	5	2	3	3	36
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Not Stated		2		2				2														2																		2	2
7. Other Methods	1				1		1													1												1									1
Total	1	2		2	1		1	2												1		2										1								2	3
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	2			1	1		1	1										1				1													1				1		2
2. Gunshot																																									
3. Lightning																																									
4. Drowning	7			3	3	1	5		2							1	1	2		1								2						2	3	1	1				7
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	7			2	5		2	4	1								1	1		1	2			2						1				1	1	2			1	1	7
8. Burns and Scalds		1		1			1					1																						1							1
9. Homicide																																									
10. Other accidents	9			1	3	2	4	1	4									2		3			1	1				2	1		3				1	1		1		2	9
Total	25	1		11	12	3	13	6	7			1				1	2	6		5	2	1	1	3				4	1	1	3			4	6	4	1	1	2	3	26
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	1	1		1	1			1	1								1			1												1		1							2
2. Tumors																																									
3. Other ill-defined causes	3	3		3	2	1	3	3									1						1	1	1			2		1		1	3		1						6
4. Heart Failure	7	1		2	6		2	5	1										1		3		2	1	1						2		1			1	2		1	1	8
Total	11	5		6	9	1	5	9	2								2		1	1	3		3	2	2			2		1	2	2	4	1	1	1	2		1	1	16
Total from all causes	116	64		120	55	5	115	53	12	44	2	7	4	1	9	2	11	16	8	10	9	8	9	14	4	8	5	9	10	14	21	13	13	11	14	25	10	17	15	17	180

CAUSES OF DEATHS BY COUNTIES IN 1904.—RENFREW.—(Including municipalities of all classes.)

General Diseases.	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Social con. Single.	Married.	Not stated.	Ages. Under 5. 0	1	2	3	4	5–9.	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 & over.	Not given.	Months. Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	10	2		11	1		9	2	1					1		3	2	2	1			1	2										1	1		1	5	2	2		12
2. Smallpox																																									
3. Measles		1		1			1						1																								1				1
4. Scarlet Fever	2	3		5			5			1			1		3														3		1					1					5
5. Whooping Cough																																									
6. Diphtheria and Croup	5	11	1	20			19	1			1		2	3	10	1	2						1						2	2	1	1		2	1	2	3	2	1	3	20
7. Influenza	2	5		5	2		2	1	1									1			1			1	1	1	2				3	2	1							1	7
8. Other Epidemic Diseases																																									
Total	19	25	1	42	3		36	7	2	1	1		4	4	13	4	4	3	1		1	1	3	1	1	1	2		5	2	5	3	2	3	1	4	9	4	3	4	45
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	3	1		6		1	5	2			2					1	1				1				2				1	2						2			1	1	7
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	21	32		42	9	2	22	31				1				3	7	7	3	8	6	7	2	3	5	1			5	1	4	6	5	3	3	6	6	2	4	5	53
4. Syphilis																																									
5. Cancer	7	8		8	7		3	12									1					2	2	2	2	5	1		2	1		1	1	2	4			1	2	1	15
6. Rheumatism and Gout	1	5		5	1		1	2				1	1			1		1						1	1					1			1		1				2	1	6
7. Diabetes																																									
8. Other General Diseases	3	3		4	2		2	4											1		2			2	1						1		2	1		2					6
9. Alcoholism, Acute and Chronic	2			1	1			2												1			1						1			1									2
Total	37	52		66	20	3	36	53			2	2	1			5	9	8	1	9	9	9	5	8	11	6	1		9	8	5	8	9	6	8	10	6	3	9	8	89
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	5	1		6			6			2						2			2										1		2	2					1				6
2. Simple Meningitis	4	1		5			4	1		2	1							2											1		1			1		1				1	5
3. Epidemic Cerebro-spinal Meningitis		1		1			1								1																					1					1
4. Congestion and Hemorrhage of Brain	4	1		1	4		1	4						1										1	1		2		1	1	3										5
5. Softening of the Brain		1		1				1														1																	1		1
6. Paralysis without specified cause	8	8		7	8	1	2	14							1							2		2	1	7	3			3	2	1	1		1	3		1	2	2	16
7. Insanity		1		1			1															1										1									1
8. Epilepsy	2	3		4	1		4	1			1					1				2				1						1				1	2				1		5
9. Convulsions (not puerperal)	8	4		12			11	1		8	2	1									1								2		2				1		3	1	1	2	12
10. Other Nervous Diseases	7	2		8	1		8	1		1		1	1		2	1						1		2										1	1	3	1	1	2		9
Total	38	23		46	14	1	38	23		13	4	2	1	1	4	4		2	2	2	1	5		6	2	7	5		5	5	10	4	1	3	5	8	5	3	7	5	61

RENFREW.—*Continued*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis	1	1					1	1											1					1												1			1		2
3. Organic Heart Diseases	16	[illegible]		16	9		9	16								2	1	2	1	1	1	1	1	3	7	5			5	2	1		1	3	2	2	5		1	3	25
4. Angina Pectoris	1			1				1																1														1			1
5. Arteries, Atheroma, Aneurism, etc.	1				1			1																1							1										1
6. Other Diseases of Circulatory System																																									
Total	19	[illegible]		19	10		10	19								2	1	2	2	1	1	1	1	6	7	5			5	2	2		1	3	2	3	5	1	2	3	29
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	[illegible]			11			9			8					1											2			1		2		1		1			1	1	4	11
2. Chronic Bronchitis																																									
3. Broncho-pneumonia	1	1		1	1		1	1		1															1				1	1											2
4. Pneumonia	[illegible]	[illegible]		15	7		10	12	3	3	1	1			1		1		1	2	1		1	3	2	4	2		2	5	3	3		2	2	1	2		1	4	25
5. Pleurisy	1	1		2	4	1	1	5	1							1			1					1	3	1			2	1	1			1					1	1	7
6. Congestion of the Lungs	8	[illegible]		10	3		8	4	1	2	1		1		1		2		1	1			1		3				2	2	3	3		1		1			1		13
7. Asthma and Emphysema		[illegible]		2				2																1	1					1							1				2
8. Other Diseases of Respiratory System																																									
Total	30	21		41	15	1	29	26	5	14	2	1	1		3	1	3	2	3	3	1		2	5	10	7	2		8	10	9	6	1	4	3	2	3	1	4	9	60
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the stomach																																									
2. Other Diseases of Stomach (cancer excepted)	2	1		1	2		1	4	1												1		1	2	1	1			2				1		1				1	1	6
3. Infantile Diarrhœa and Cholera Infantum	18	13		31			31			25	4	1			1														2	2	3	1		2	3	10	3	3	1	1	31
4. Diarrhœa and Enteritis (not infantile)	2	2		3	1		3	1							1	1						1			1				1		1			1	1						4
5. Dysentery		1			1			1																		1									1						1
6. Hernia and Intestinal obstructions	1	1		3	2			5										1							1	2	1				2	1					1				5
7. Other Diseases of the Intestines		1		1			1											1																	1						1
8. Diseases of the Liver	2	2		3	1		2	2											1				1	2							2	1			1						4
9. Peritonitis (not puerperal)	1				1			1																				1								1					1
10. Iliac Abscess and Appendicitis	2	6		8			6	2							1		3	2				1		1					2		2	1				1	1			1	8
Total	31	30		53	8		44	16	1	25	1	1			3	1	3	4	1		1	2	2	5	3	4	1	1	7	2	10	4	1	3	8	13	5	3	2	3	61
VII. GENITO-URINARY SYSTEM																																									
1. Acute Nephritis																																									
2. Bright's Disease	4	1		6	2		3	5							1	1		1					1	2		2			3		1		1			1		1		1	8
3. Other Diseases of Kidneys and Adnexa	2	1		2	1			3																	3									1	1					1	3
4. Vesical Calculi																																									
5. Diseases of the Bladder	1	1		2				2														1				1								1				1			2
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of Female Genital Organs																																									
Total	7	6		10	3		3	10							1	1		1				1	1	2	3	3			3		1		1	2	1	1		2		2	13

VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicaemia																																								
2. Puerperal Albuminuria and Convulsions		1			1			1												1															1						1
3. Other accidents of Pregnancy sudden death		8		7	1			8										3	2	2	1								2				2		1	2					8
4. Puerperal Diseases of the Breast																																								
Total		9		7	2			9										3	2	3	1								2				2		2	2	1				9
IX. OTHER DISEASES OF THE SKIN.																																								
1. Erysipelas		1		1				1																1										1							1
2. Other dis. of Skin & Adnexa (cancer excepted)	1			1			1										1														1										1
Total	1	1		2			1	1									1							1							1										2
X. LOCOMOTOR SYSTEM																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation (for unspecified Diseases)																																								
Total																																								
XI. MALFORMATIONS, ETC.																																								
1. Still-Births	14	12	3	29			29			29																			2	2	1	2	3	3	1	1	4	3		4	29
2. Congenital Debility and Malformations	50	36		86			86			84	2																		8	4	7	11	12	7	5	9	5	7	4	7	86
3. Other Diseases of Infancy	3	6		9			9			2	3	3	1																2	1		3	1	1			1				9
4. Senile Decay	49	35		20	61	3	3	79	2																6	29	48	1	8	9	7	5	6	7	2	4	6	15	9	8	84
Total	116	89	3	144	61	3	127	79	2	115	5	3	1												6	29	48	1	20	16	15	21	22	18	8	17	16	25	15	19	208
XII. SUICIDE.																																								
1. Poison	1	1		1	1		1	1												1				1													1			1	2
2. Strangulation																																								
3. Gas Poisoning																																								
4. Drowning																																								
5. Firearms	1				1		1																	1													1				1
6. Not stated	2			2			2													1	1																		2		2
Total	4	1		3	2		4	1												2	1			2													2		2	1	5
XIII. ACCIDENTS.																																								
1. Fractures and Dislocations	3			3			2		1								1	1				1									1							1	1		3
2. Gunshot	2			2			2												1	1																			1	1	2
3. Lightning	2				2			2												1						1								1		1					2
4. Drowning	1	1		2			2								1	1																		1		1					2
5. Electric Cars																																								
6. Bicycles																																								
7. Railways	14			3	1	10	1	1	9										1	1		2						10		10		3		1							14
8. Burns and Scalds	1	1		2			1	1						1					1										1							1					2
9. Homicide																																								
10. Other Accidents	7	1		5	3		3	4	1						1		1			1		2	1				2		1	2				1				2	1	1	8
11. Asphyxiated	1				1		1											1																					1		1
Total	31	3		17	7	10	12	11	11					1	2	1	2	2	3	4		5	1			1	2	10	2	12	1	3		4		3		3	4	2	34
XIV. ILL-DEFINED CAUSES.																																								
1. Dropsy	6	1		5	4	1	3	7								1	1						1		3	2	2				2	2		1	1	1	1		2		10
2. Tumors	1			1			1					1																												1	1
3. Other Ill-Defined Causes	3	1		5	1	1	2	4	1						1		1				2	1		1	1				2			1		1	1		2				7
4. Heart Failure	4	6		9	1		5	5								1		1	1		2	1	1	2	1				1	2		2		1			3	1			10
Total	11	11		20	6	2	11	16	1			1			1	2	2	1	1		4	2	2	3	5	2	2		3	2	2	5		3	2	1	6	1	2	1	28
Total from all causes	356	284	4	473	151	20	351	271	22	168	18	10	8	6	27	21	25	28	19	24	20	26	17	39	48	65	63	12	69	59	61	54	40	50	40	64	58	44	48	57	644

CAUSES OF DEATHS BY COUNTIES IN 1904.—SIMCOE.—(Including municipalities of all classes).

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canadian.	Nativity. Foreign.	Nativity. Not stated.	Social Con. Single	Social Con. Married.	Social Con. Not stated.	Ages. Under 5. 1 0	Under 5. 1	Under 5. 2.	Under 5. 3	Under 5. 4	5-9	10-14.	15-19.	20-24	25-29.	30-34	35-39.	40-44	45-49	50-59.	60-69	70-79	80 and over.	Not given.	Months. January	February	March	April	May.	June.	July.	August.	September	October.	November.	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	6	4	....	8	2	....	3	7	....	....	..	..	.	1	..	..	1	1	1	1	2	1	..	1	..	1	..	..	1	..	1	.	1	..	1	1	1	3	..	1	10
2. Smallpox	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
3. Measles	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
4. Scarlet Fever	1	3	....	4	....	....	4	....	....	....	..	1	1	.	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	..	4
5. Whooping Cough	7	3	....	10	....	....	10	....	....	7	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	1	1	..	..	..	..	2	..	1	10
6. Diphtheria and Croup	12	6	....	18	....	....	14	3	1	1	1	1	1	2	4	3	..	..	..	2	1	1	1	..	..	..	..	..	1	2	1	.	1	1	3	1	3	1	1	3	18
7. Influenza	5	5	....	5	5	....	1	9	....	....	..	..	..	..	..	..	..	..	..	..	..	1	..	1	4	3	1	..	2	5	2	..	..	..	..	..	..	1	..	.	10
8. Other Epidemic Diseases	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Total	31	21	..	45	7	....	32	19	1	8	4	2	2	3	5	3	2	1	1	3	3	3	1	2	4	4	1	..	4	13	5	3	3	1	4	2	4	7	1	5	52
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	3	...	1	3	1	....	4	1	....	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	1	..	2	..	..	1	..	1	..	..	..	1	..	..	5
2. Malarial Fever	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
3. Tuberculosis and Scrofula	13	45	....	79	8	1	58	30	....	....	..	1	..	1	..	2	8	19	18	7	7	5	7	7	3	3	..	..	2	12	5	10	10	10	8	7	3	7	6	8	88
4. Syphilis	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
5. Cancer	19	18	....	20	17	...	5	31	1	....	..	..	..	..	..	..	1	..	..	..	1	1	2	12	8	8	4	..	3	1	6	2	6	4	2	1	2	3	2	5	37
6. Rheumatism and Gout	3	8	....	8	3	...	4	7	....	....	..	..	..	..	..	1	1	1	..	..	..	1	1	..	3	1	2	..	..	1	1	2	..	1	2	1	..	1	..	2	11
7. Diabetes	4	....	....	4	....	....	3	1	....	....	..	..	..	..	..	1	..	..	..	..	1	1	..	..	1	..	..	..	1	1	1	..	..	1	..	..	..	..	..	..	4
8. Other General Diseases	6	11	....	13	4	....	2	15	....	....	..	..	..	..	..	..	..	1	2	..	4	1	1	5	1	2	..	..	2	1	..	2	3	4	4	..	..	..	..	1	17
9. Alcoholism, Acute and Chronic	1	....	....	1	....	....	....	1	....	....	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Total	78	85	....	126	35	2	72	89	2	..	..	1	..	1	..	4	10	21	20	7	13	10	11	26	17	15	7	..	11	16	13	17	19	21	16	9	5	12	8	16	163
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	....	1	....	1	....	....	1	....	....	....	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
2. Simple Meningitis	12	10	..	21	1	....	21	1	..	8	2	1	1	1	1	3	2	..	1	..	..	..	1	..	1	..	..	..	1	1	3	2	2	1	1	3	2	2	4	..	22
3. Epidemic Cerebro-spinal Meningitis	3	7	....	10	....	..	8	2	...	5	..	..	..	1	..	1	1	..	1	..	..	..	..	1	..	..	..	..	..	1	1	..	..	1	1	..	2	2	2	..	10
4. Congestion and Hemorrhage of Brain	18	22	....	21	18	1	8	32	...	....	..	..	..	..	..	..	..	..	1	..	1	..	5	7	9	10	7	..	3	5	2	3	7	4	2	3	1	1	3	6	40
5. Softening of the Brain	2	2	..	3	..	1	....	4	....	....	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	1	..	..	..	1	..	..	..	1	..	..	1	..	1	..	4
6. Paralysis without specified cause	13	12	....	9	16	....	4	21	....	....	..	..	..	..	..	..	1	..	..	..	1	..	..	2	7	10	4	..	6	2	2	2	..	1	3	1	2	3	3	..	25
7. Insanity	....	2	....	1	1	....	1	1	....	....	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	2
8. Epilepsy	4	1	....	5	....	....	5	....	....	....	..	..	..	..	..	1	1	2	1	..	..	..	..	..	..	..	..	..	..	1	2	..	1	..	..	1	..	..	..	..	5
9. Convulsions (not puerperal)	6	13	....	19	....	....	19	....	....	11	4	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	2	3	4	2	1	..	2	..	2	19
10. Other Nervous Diseases	2	4	....	5	1	....	1	5	....	....	..	..	..	..	..	..	..	..	..	1	2	..	1	1	..	1	..	..	1	..	2	..	1	..	..	..	2	..	..	..	6
Total	60	74	....	95	37	2	68	66	....	24	6	2	2	3	3	5	5	3	4	1	4	1	8	11	19	22	11	..	13	12	13	9	16	12	9	9	11	10	13	8	134

IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis	1			1			1								1																					1					1
3. Organic Heart Diseases	34	39		45	27	1	17	54	2								2	3	5	1	3	3	4	7	13	25	7		8	5	10	10	2	6	8	2	5	6	7	4	73
4. Angina Pectoris		1		1				1																1							1										1
5. Arteries, Atheroma, Aneurism, etc.	2	1		2	1		1	2																	2	1				1	1						1				3
6. Other Diseases of the Circulatory System																																									
Total	37	41		49	28	1	19	57	2						1		2	3	5	1	3	3	4	8	15	26	7		8	6	12	10	2	6	8	3	6	6	7	4	78
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	12	9		12	9		11	10		9		1														7	4		2	2	3	4	3	1				1	3	2	21
2. Chronic Bronchitis	3			1	2			3																		2	1						1		1					1	3
3. Broncho-pneumonia	9	8		15	2		15	2		13	1							1							1	1			2	3	2	1	2				1	1	2	3	17
4. Pneumonia	30	15		30	13	2	19	25	1	4	3		1		3	1	3	1	1	1		1	5	1	4	11	5		8	7	5	4	4	3		2	1	2	6	3	45
5. Pleurisy	5	5		7	3		1	9										2	1		1			3		3			1	1	1		1	1	1	1	1	1	1		10
6. Congestion of the Lungs, inc. pul. apoplexy	2	4		3	3		2	4		1						1				1		1			1	1			2		1					1			1	1	6
7. Asthma and Emphysema	3	1		2	2			4																	1	2	1			1								1	1	1	4
8. Other Diseases of the Respiratory System																																									
Total	64	42		70	34	2	48	57	1	27	4	1	1		3	2	3	4	2	2	1	2	5	4	7	27	11		15	14	12	9	11	5	2	4	3	6	14	11	106
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	2	4		3	3		3	3								1	1								2	2						1		1			1		1	2	6
3. Infantile Diarrhœa and Cholera Infantum	16	3		19			19			16	1	1	1																	2			1	2	2	5	5	2			19
4. Diarrhœa and Enteritis (not infantile)	4	2		4	2		2	4							1			1						2	1	1			1				1		1		1		1	1	6
5. Dysentery	1	2			2	1		3																	2	1											1	1	1		3
6. Hernia and Intestinal obstructions	2	2		2	2		2	2					1		1										1	1			1	2							1				4
7. Other Diseases of the Intestines	2			2			2																1		1					1						1					2
8. Diseases of the Liver	2			2			1	1								1									1									1						1	2
9. Peritonitis (not puerperal)	4	3		7			4	3		1			1	1				1		1				2								2	1	1		1	1	1			7
10. Iliac Abscess and Appendicitis	5	4		8	1		7	1	1						1		4	2	1	1									1			2	1		2		1		1	1	9
Total	38	20		47	10	1	40	17	1	17	1	1	3	1	3	2	5	4	1	2			1	4	8	5			3	5		5	4	5	5	7	11	4	4	5	58
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis		2			2			2																	1	1				1		1									2
2. Bright's Disease	15	12		19	8		7	19	1								3	1	1		1	3	1	7	3	7			2	2	5	2	2	4	1	2		3		4	27
3. Other Diseases of Kidneys and Adnexa	6	3		7	2		1	8										2					2	1	2		2		2			2				1	1	1		2	9
4. Vesical Calculi																																									
5. Diseases of the Bladder	4			2	2		1	3																3		1			2			2									4
6. Diseases of the Male Genital Organs	2			1	1			2																	1	1											1	1			2
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs		1		1				1											1																1						1
Total	29	16		30	15		9	35	1								3	3	2		1	3	3	11	7	10	2		6	3	5	7	2	4	2	3	2	5		6	45
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		2		2				2												1	1											1			1						2
2. Puerperal Albuminuria and Convulsions		6		6				6									1	2	1	1	1								1									2	2	1	6
3. Other Accidents of Pregnancy, sudden death		6		6				6										1	1	1	3								1	1			3			1					6
4. Puerperal Disease of the Breast																																									
Total		14		14				14									1	3	2	3	5								2	1		1	3		1	1		2	2	1	14

SIMCOE.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IX. THE SKIN.																				
1. Erysipelas	2			2			1	1												
2. Skin and Adnexa (cancer excepted)		4		2	2			1											1	
Total	2	4		4	2		1	5											1	
X. LOCOMOTOR SYSTEM.																				
1. Pott's Disease																				
2. Diseases of Bones and Joints																				
3. Amputation (for unspecified diseases)																				
Total																				
XI. MALFORMATIONS, ETC.																				
1. Still Births	32	25	1	58			58			58										
2. Congen. Debility and Malformation	15	15	1	91			91			90	1									
3. Other Diseases of Infancy	3	2		5			5				2	1	1	1						
4. Senile Decay	81	67		20	128	3	5	146												
Total	164	139	2	174	128	3	159	146		148	3	1	1	1						
XII. SUICIDE.																				
1. Poison	1				1			1												1
2. Strangulation																				
3. Gas Poisoning																				
4. Drowning																				
5. Firearms																				
6. Not stated	1				1		1													
Total	2				2		1	1												1
XIII. ACCIDENT.																				
1. Fractures and Dislocations	7	2		7	1	1	6	2	1					1	1		1	2		
2. Gunshot																				
3. Lightning																				
4. Drowning	12	1		11	1	1	10	2	1		1	1					1	1	1	1
5. Electric Cars																				
6. Railways	8			5	3		1	4										2	1	2
7. Burns and Scalds		2		2			1	1							1					
8. Other Accidents	16	3	1	14	6		14	6		2				1	2	3		2	3	2
Total	43	8	1	39	11	2	35	15	2	2	1	1		2	4	3	2	10	5	5
XIV. ILL DEFINED CAUSES.																				
1. Dropsy	2	3		3	1	1	1	1												
2. Tumors		2		2				2												
3. Other Ill-Defined Causes	10	5		12	2	1	11	2	2						1	1	2	3		
4. Heart Failure	11	9		15	5		10	10								1	2	1	1	3
Total	23	19		32	8	2	22	18	2						1	2	4	4	1	3
Total from all causes	571	483	3	725	317	15	540	539	12	226	19	9	9	11	20	21	37	56	44	28

Number of Column.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																					
1. Erysipelas				1	1							1						1			2
2. Skin and Adnexa (cancer excepted)	1			1		1							1				1	2			4
Total	1			2	1	1						1	1				1	3			6
X. LOCOMOTOR SYSTEM.																					
1. Pott's Disease																					
2. Diseases of Bones and Joints																					
3. Amputation (for unspecified diseases)																					
Total																					
XI. MALFORMATIONS, ETC.																					
1. Still Births									7	6	5	3	6	3	6	4	6	3	7	2	58
2. Congen. Debility and Malformation									6	10	5	7	13	10	7	7	7	7	5	7	91
3. Other Diseases of Infancy									1					1	1			1		1	5
4. Senile Decay					6	53	91	1	25	20	19	6	22	8	2	10	7	8	12	12	151
Total					6	53	91	1	39	36	29	16	41	22	16	21	20	19	24	22	305
XII. SUICIDE.																					
1. Poison																		1			1
2. Strangulation																					
3. Gas Poisoning																					
4. Drowning																					
5. Firearms																					
6. Not stated					1								1								1
Total					1								1					1			2
XIII. ACCIDENT.																					
1. Fractures and Dislocations	2			1	1				1		1			2	2	2			1		9
2. Gunshot																					
3. Lightning																					
4. Drowning		1		1	1			1					2	7	1	3					13
5. Electric Cars																					
6. Railways	1		2						1		1		2			2			2		8
7. Burns and Scalds				1							1				1						2
8. Other Accidents	1		1		2	1			2	1	1	1	2		4	2	2	1	2	2	20
Total	4	1	3	3	4	1		1	4	1	4	1	6	9	8	9	2	1	5	2	52
XIV. ILL DEFINED CAUSES.																					
1. Dropsy					3	2					1					1		2	1		5
2. Tumors				1	1								1					1			2
3. Other Ill-Defined Causes	2	1	1	2		1		1		2	3	1		2	2	1		3	1		15
4. Heart Failure	1	2		5	4				1	1	4	2			3	1		2	4	2	20
Total	3	3	1	8	8	3		1	1	3	8	3	1	2	5	3		8	6	2	42
Total from all causes	38	26	37	79	97	167	130	3	106	110	101	82	109	87	76	71	65	84	84	82	1,057

CAUSES OF DEATHS BY COUNTIES IN 1904.—STORMONT, DUNDAS AND GLENGARRY.—(Including municipalities of all classes).

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social Con. Single.	Social Con. Married.	Social Con. Not stated.	Ages. Under 5. 0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over.	Not given.	Months. Jan.	Feb.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	6	6		12			9	2	1				1		2	2	1	2			2	1	1						1		1		1	2	3	1	1	1	1		12
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	2		4			4					3			1																					1			2	1	4
5. Whooping Cough	2	5		7			7			5	1			1																	1				1	1	1	2	1		7
6. Diphtheria and Croup	7	9		16			16			3	2	1	4		1	1		1											2	1	3	2	1				1		2	4	16
7. Influenza	8	5		13			5	8		2	1					1										6	3		1	4	2	4		1						1	13
8. Other Epidemic Diseases																																									
Total	25	27		52			41	10	1	10	4	4	5	1	7	4	1	3			2	1	1			6	3		4	5	7	6	2	3	4	3	3	3	6	6	52
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	6	2		6	1	1	3	1	1	1					1	1				2	1	1				1				1				1	1	1	3	1			8
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	63	86		135	13	1	83	63	3		5	2	1		4	9	7	16	21	13	16	8	13	9	11	6	3	5	12	6	12	22	15	10	13	7	7	20	9	16	149
4. Syphilis																																									
5. Cancer	11	23		31	2	1	7	25	2								1		2	1	2	2	3	4	9	6	4		3	4	3	2	5			5	4	1	1	6	34
6. Rheumatism and Gout	1	6		7			3	4								1				1					3	1	1		1	1		2				1		2			7
7. Diabetes	1	1		2			1	1										1							1						2										2
8. Other General Diseases	4	5		8	1		1	8										1		1	2			2	2	1					1		2		3	1				2	9
9. Alcoholism, Acute and Chronic																																									
Total	86	123		189	17	3	98	105	6	1	5	2	1		5	11	8	18	23	18	21	11	16	15	26	15	8	5	16	12	18	26	22	11	17	15	14	24	10	24	209
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	3	5		8			7	1		2		2		2	1									1					1	2			2			1		1		1	8
2. Simple Meningitis	5	4		8	1		9			4			1		1	1	1								1					1		1					3		3	1	9
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of Brain	12	6		13	3	2	1	17													1		1	5	5	5	1		1		2	1	2	1		3	1	1	1	5	18
5. Softening of the Brain																																									
6. Paralysis without specified cause	13	15		25	2	1	6	21	1									2			1		2	1	4	12	6		4	3	2	4	3	1		3	2	1	3	2	28
7. Insanity		1		1			1																1															1			1
8. Epilepsy	1	2		2	1		2	1										1		1		1							1		1			1							3
9. Convulsions (not puerperal)	4	4		8			8			6		1	1																	1	1		1		1	1	1		2		8
10. Other Nervous Diseases		3		3			2	1										1		1					1						1		1	1							3
Total	38	40		68	7	3	36	41	1	12		3	2	2	2	1	1	4		2	2	1	4	7	11	17	7		7	7	7	6	9	4	1	8	7	4	9	9	78

STORMONT, DUNDAS AND GLENGARRY.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis	1			1			1												1													1									1
3. Organic Heart Disease	17	14		25	5	1	5	24	2						1							1	2	5	7	12	3		4	3		3	2	3	4	2	2	2	1	5	31
4. Angina Pectoris	1			1				1																1								1									1
5. Arteries, Atheroma, Aneurism, etc.	5			5				5													2			1	2								1	1	2				1		5
6. Other Diseases of the Circulatory System																																									
Total	24	14	..	32	5	1	6	30	2						1				1		2	1	2	7	9	12	3		4	3		5	3	4	6	2	2	2	2	5	38
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	8	9		16	1		6	10	1	4	1	1						1	1			1	2		1	4	1		1	2	2	5	1	1				3	1	1	17
2. Chronic Bronchitis		2		2				2																	1		1						1					1			2
3. Broncho-pneumonia	4	4		8			4	3	1	1	1		2					1				1				2			1	1	1	1	1		1		1		1		8
4. Pneumonia	41	23		56	6	3	30	33	1	19	5	1		1	1	1	2	1	2	2	2	2	1	3	9	10	2		5	9	10	7	5	1	3	2	1	4	4	13	64
5. Pleurisy	2	1		1	1	1	1	2																1	1	1			1		1			1							3
6. Congestion of the Lungs, inc. pul. apoplexy	5	1		5	1		5	1		4	1																1				2			1				1		2	6
7. Asthma and Emphysema	2			1	1			1	1																1	1					1					1					2
8. Other Diseases of the Respiratory System																																									
Total	62	40	....	88	10	4	46	52	4	28	8	2	2	1	1	1	2	3	3	2	2	4	3	4	13	18	5	.	8	12	17	13	8	4	4	3	2	9	6	16	102
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	5	9		14			7	7						1		1				1			1	4	3	2	1		1		2	1	1	1	2	1	1	1	2	1	14
3. Infantile Diarrhœa and Cholera Infantum	11	9		20			20			19	1																					1	1	1	3	8	3	2		1	20
4. Diarrhœa and Enteritis (not infantile)	5	6		9	1		3	7						1			1	1						2	1	3	1			2		1		1		1	1		1	3	10
5. Dysentery		1		1				1																		1									1						1
6. Hernia and Intestinal obstructions		2		2				2											1	1																2					2
7. Other Diseases of the Intestines	2	1		2	1		2	1											1			1				1								1					1	1	3
8. Diseases of the Liver	3	3		4	2			6																3	2	1			1		1			2		1				1	6
9. Peritonitis (not puerperal)		2		2			2			1								1																	1					1	2
10. Iliac Abscess and Appendicitis	6	4		9		1	5	5							2	2	1	1			1	1	1			1				1	3					3	3				10
Total	32	36	....	63	4	1	39	29	....	20	1	.	.	2	2	3	2	3	2	2	1	2	2	9	6	9	2	.	2	3	6	3	2	6	7	16	8	3	4	8	68
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	1	1		2				2																1		1				1		1									2
2. Bright's Disease	7	7		11	2	1		14											1	2	3		1		2	5			2	1	1	1		1	2	2	1		1	2	14
3. Other Diseases of Kidneys and Adnexa	9	2		8	2	1	2	9											1				1		2	3	3	1		2	1	1		1	1			2	2	1	11
4. Vesical Calculi																																									
5. Diseases of the Bladder	1	1		1	1		1	1											1							1											1			1	2
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		1		1				1																	1				1												1
10. Other Diseases of the Female Genital Organs																																									
Total	18	12	....	23	5	2	3	27	....	....									3	2	3	..	2	1	5	10	3	1	3	4	2	3	..	2	3	2	2	2	3	4	30

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other Accidents of Pregnancy, sudden death		8		8			1	7										3	1	1	2	1										2	2	1		1	1		1		8
4. Puerperal Disease of the Breast																																									
Total		8		8			1	7										3	1	1	2	1										2	2	1		1	1		1		8
IX. THE SKIN.																																									
1. Erysipelas	1	2		3				3														1				1	1		1							1				1	3
2. Skin and Adnexa (cancer excepted)																																									
Total	1	2		3				3														1				1	1		1							1				1	3
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation for unspecified Diseases																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still Births	20	5	2	27			27			27																			3	2	1	2	4	3	2	4	3	1		2	27
2. Congenital Debility and Malformations	50	39	1	90			90			90																			9	8	9	7	10	6	6	7	10	6	6	6	90
3. Other Diseases of Infancy	2	1		3			3			2		1																				1	1						1		3
4. Senile Decay	83	75		110	43	5	20	128	10																5	40	112	1	21	20	23	8	11	7	16	10	8	11	12	11	158
Total	155	120	3	230	43	5	140	128	10	119		1														40	112	1	33	30	33	18	26	16	21	21	21	18	19	19	278
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation	1			1				1																	1													1			1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Other Methods																																									
Total	1			1				1																	1													1			1
XIII. ACCIDENT.																																									
1. Fractures and Dislocations	2	2		4			2	2							1	1											2						1			1	1	1			4
2. Gunshot	2	1		2	1		1	2									1								1	1			1		1				1						3
3. Lightning																																									
4. Drowning	9	3		12			11	1			1				2	2	3	2			1					1						1	2	5	2	1				1	12
5. Tetanus																																									
6. Asphyxiated																																									
7. Railways	2			2				2																			2		1					1							2
8. Burns and Scalds	1	5		6			6				1				1	2			1	1											1		2	1				1	1		6
9. Poison																																									
10. Other accidents	11	1		10	2		6	6				1					2	1	2	1		1			1	1	2		1			1	1	2	2		2	1		2	12
Total	27	12		36	3		26	13			2	1			4	5	6	3	3	2	1	1			2	3	6		3		2	2	6	9	5	2	3	3	1	3	39
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	4	2		5	1		2	3	1								1								2	1	2			1				1			1	3			6
2. Tumors	2	9		9	2		3	8							1				1		2			2	2	3			1	2			1	1	1	1	2		1	1	11
3. Other Ill defined Causes	5	5		9	1		4	5	1						1				1	1	2		2		2			1	1		1	4		2		1		1			10
4. Heart Failure	12	7		19			5	14										1	1	1	1		2	7	5			1	4	1		1	4	4			2	1	2		19
Total	23	23		42	4		14	30	2						2		1	1	3	2	5		4	9	11	4	2	2	6	4	1	5	5	8	1	2	5	5	3	1	46
Total from all causes	492	457	3	835	98	19	450	476	26	190	20	13	10	6	24	25	21	38	39	31	41	23	34	52	89	135	152	9	87	80	93	89	85	68	72	76	68	74	64	96	962

CAUSES OF DEATHS BY COUNTIES IN 1904.—THUNDER BAY.—(Including Municipalities of all classes.)

General Diseases	Sex: Male	Sex: Female	Sex: Not stated	Nativity: Canada	Nativity: Foreign	Nativity: Not stated	Social con.: Single	Social con.: Married	Social con.: Not stated	Ages (Under 5): 0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Months: January	February	March	April	May	June	July	August	September	October	November	December	Total
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	33	2		13	21	1	26	8	1		1		1		2	1	1	12	4	4	2	1	1	2	3				3	1	1	1	4	1	1	3	4	8	4	4	35
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2			1		1	2			1									1										1											1	2
5. Whooping Cough	1			1			1					1																			1										1
6. Diphtheria and Croup	11	8		19			19			4	1	3	4	1	1	2													1			1	1				1	4	6	5	19
7. Influenza	2			2			1	1							1									1							1		1								2
8. Other Epidemic Diseases																																									
Total	49	10		36	21	2	49	9	1	5	2	4	5	1	7	3	1	12	5	4	2	1	1	3	3				5	1	3	2	6	1	1	3	5	12	10	10	59
II. OTHER GENERAL DISEASES																																									
1. Pyæmia and Septicæmia	2	2		2	2		2	2									1	1		1			1							1		1							1	1	4
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	16	13		18	10	1	19	[illegible]	[illegible]		1	1			2	4	6	2	4		1	2	2	4					5	2	2	2	2	3	3	6	2		2		29
4. Syphilis																																									
5. Cancer	4			1	3		1	[illegible]													1			1	2									1		1		1	1		4
6. Rheumatism and Gout	1			1			1														1												1								1
7. Diabetes	1			1			1												1																			1			1
8. Other General Diseases	1			1			1										1																							1	1
9. Alcoholism, Acute and Chronic																																									
Total	25	15		24	15	1	25	12	3		1	1			2	4	8	3	5	1	3	2	3	5	2				5	3	2	3	3	4	3	7	2	2	4	2	40
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis		2		2			2			1		1																		1					1						2
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	2	1		2		1	1	2																1	2								2				1				3
5. Softening of the Brain																																									
6. Paralysis without specified cause	1	1			2			2																2							1				1						2
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	2	5		7			7			7																							1		1		1		3	1	7
10. Other Nervous Diseases																																									
Total	5	9		11	2	1	10	4		8		1												3	2					1	1		3		3		2		3	1	14

																																							Total
IV. CIRCULATORY SYSTEM.																																							
1. Pericarditis																																							
2. Endocarditis	1	1	1	1																																			1
3. Organic Heart Diseases	8	3	5	6	1	7	1	2	1	1	2	4	2	2	1	2	2	2																					11
4. Angina Pectoris																																							
5. Diseases of Arteries, Atheroma, Aneurism, etc																																							
6. Other Diseases of the Circulatory System	1	1	1	1	1																																		1
Total	19	3	5	8	5	8	1	1	2	1	1	3	4	3	2	1	2	1	2	2																			13
V. RESPIRATORY SYSTEM.																																							
1. Acute Bronchitis	3	4	7	6	1	5	1	1	3	1	1	1	1																										7
2. Chronic Bronchitis	1	1	1	1	1																																		1
3. Broncho-pneumonia	2	3	2	2	1	2	3	2	1	2	2																												1
4. Pneumonia	27	13	27	10	3	27	10	3	7	3	2	1	1	1																									5
5. Pleurisy	5	2	2	1	3	3	4	1	3	1	2	1	4	2	3	2	5	1	4	3	1	7	5	3															10
6. Congestion of the Lungs (inc. pul. apoplexy)	2	1	3	2	1	1	1	1	1	1	1																												3
7. Asthma and Emphysema																																							
8. Other Diseases of the Respiratory System																																							
Total	35	21	29	13	4	38	15	3	13	3	3	2	1	5	2	2	2	3	4	4	1	3	1	4	2	1	8	2	6	4	6	2	4	3	3	8	5	5	56
VI. DIGESTIVE SYSTEM.																																							
1. Ulcer of the Stomach																																							
2. Other Dis's. of the Stomach (Cancer excepted)																																							
3. Infan. Diarr. and Cholera Infantum	11	4	15	15	15	1	1	5	2	1	1	1																											15
4. Diarrhœa and Enteritis (not infantile)	1	2	5	1	2	1	1	1	1	1	1																												3
5. Dysentery																																							
6. Hernia and Intestinal obstructions																																							
7. Other Diseases of the Intestines																																							
8. Diseases of the Liver	1	1	1																																				
9. Peritonitis (not puerperal)	2	2	2	1	1	1																																	1
10. Iliac Abscess and Appendicitis	1	2	1	2	1	2	1	1	1	1	1	1	1	1																									2 3
Total	14	10	22	2	17	7	15	1	1	1	3	2	1	1	1	1	1	1	5	6	3	1	2	2															21
VII. GENITO-URINARY SYSTEM.																																							
1. Acute Nephritis	2	1	2	1	2	1	1	1	1	1	2																												3
2. Bright's Disease	3	3	6	6	1	1	1	1	2	1	1	1																											6
3. Other Diseases of the Kidneys and Annexa																																							
4. Vesical Calculi	1	1	1	1	1																																		1
5. Diseases of the Bladder	1	1	1	1	1																																		1
6. Diseases of the Male Genital Organs																																							
7. Metritis																																							
8. Other Diseases of the Uterus																																							
9. Ovarian Cysts and other Ovarian Tumors																																							
10. Other Diseases of the Female Genital Organs																																							
Total	7	1	2	6	3	2	9	1	1	1	1	1	1	5	3	1	2	1	2	1	1																		11
VIII. PUERPERAL DISEASES.																																							
1. Puerperal Septicaemia																																							
2. Puerperal Albuminuria and Convulsions																																							
3. Other Accidents of Pregnancy, sudden death																																							
4. Puerperal Disease of the Breast																																							
Total																																							

THUNDER BAY.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IX. THE SKIN.																				
1. Erysipelas																				
2. Skin and Adnexa (cancer excepted)																				
Total																				
X. LOCOMOTOR SYSTEM.																				
1. Pott's Disease																				
2. Disease of Bones and Joints																				
3. Amputation (for unspecified disease)																				
Total																				
XI. MALFORMATIONS, ETC.																				
1 Still Births	7	6		15			15			15										
2 Congenital Debility and Malformations	18	10		2			28			28										
3 Other Diseases of Infancy	1	1					5			4		1								
4 Senile Decay	6	1		5	4	1	2	8												
Total	32	24		[illegible]	4	1	48	8		[illegible]		1								
XII. SUICIDE.																				
1. Poison																				
2. Strangulation																				
3. Gas Poisoning																				
4 Drowning																				
5. Firearms																				
Total																				
XIII. ACCIDENT.																				
1. Fractures and Dislocations	16			4	9	5	6	9	1								1	1	1	4
2. Gunshot	4				4		2	1	1										2	1
3. Lightning																				
4 Drowning	7	1		2	6		1	4			1							1		3
5. Electric Cars																				
6 Bicycles																				
7. Railways	11			4	4	3	5	5	1									5		1
8. Burns and Scalds		2		2			2	8				2								
9 Homicide																				
10. Other Accidents	4			2	2		2	2				1							2	
Total	12	3		16	23	6	21	21	5		1	3					1	7	5	9
XIV. ILL-DEFINED CAUSES.																				
1. Dropsy																				
2. Tumors	1	1		2			1	1			1								1	
3. Other Ill-Defined Causes	5	2		7			5	2			3					1	1			
4 Heart Failure	1	1		1	1		1	1									1			
Total	7	4		10	1		7	4			4					1	2		1	
Total from all causes	226	103	....	216	95	18	222	97	10	86	11	13	8	2	11	14	15	25	19	20

Number of Column	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																					
1. Erysipelas																					
2. Skin and Adnexa (cancer excepted)																					
Total																					
X. LOCOMOTOR SYSTEM.																					
1. Pott's Disease																					
2. Disease of Bones and Joints																					
3. Amputation (for unspecified disease)																					
Total																					
XI. MALFORMATIONS, ETC.																					
1 Still Births										1	3						3	2		1	15
2 Congenital Debility and Malformations										3	1	1	1	1	5	2	5	7	1	3	28
3 Other Diseases of Infancy										2		1					1	1			5
4 Senile Decay					1	7	2		1		2	1	2				2	1		1	10
Total					1	7	2		1	6	9	3	6	1	5	2	9	5	1	5	56
XII. SUICIDE.																					
1. Poison																					
2. Strangulation																					
3. Gas Poisoning																					
4 Drowning																					
5. Firearms																					
Total																					
XIII. ACCIDENT.																					
1. Fractures and Dislocations	5	2	1	1						1	2	1	1	2	1	1	1	3	2	1	16
2. Gunshot	1										1			1				1		1	4
3. Lightning																					
4 Drowning	2				1												5	1	2		8
5. Electric Cars																					
6 Bicycles																					
7. Railways		1	2	1				1					2		1	4		1	1	2	11
8. Burns and Scalds														2							2
9 Homicide																					
10. Other Accidents			1							1				1				1	1		4
Total	8	3	4	2	1			1		2	5	1	3	6	2	5	6	7	6	1	45
XIV. ILL-DEFINED CAUSES.																					
1. Dropsy																					
2. Tumors										1			1								2
3. Other Ill-Defined Causes			1		1							2	1				2			2	7
4 Heart Failure	1									1					1						2
Total	1		1		1					2		2	2		1		2			2	11
Total from all causes	23	13	11	13	19	15	4	2	26	18	24	19	33	19	28	28	33	35	33	33	329

CAUSES OF DEATHS BY COUNTIES IN 1904.—VICTORIA.—(Including municipalities of all classes.)

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social Con. Single.	Social Con. Married.	Social Con. Not stated.	Ages. Under 5. 0.	1.	2.	3.	4.	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given.	Months. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	2	4		6			4	2							1		1	1			1			2					1						2	1	1	1			6
2. Smallpox																																									...
3. Measles																																									...
4. Scarlet Fever	2	2		4			4				1	2	1																	1	2	1									4
5. Whooping Cough																																									
6. Diphtheria and Croup	2	2		4			4			1					3														1		1									2	4
7. Influenza	5	2		4	3		3	4				2														2	3		3	3		1									7
8. Other Epidemic Diseases																																									...
Total	11	10		18	3		15	6		1	1	4	1		4		1	1			1			2		2	3		5	4	3	2			2	1	1	1		2	21
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	1		3			3			1		1						1														1							2		3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	17	27		41	2	1	22	22								3	5	4	8	9	1	2	5	4	2	1			2	3	5	7		5	4	4	5	4	3	2	44
4. Syphilis																																									
5. Cancer	3	5		7	1			8														2	1	2	2		1		1			1	2		2	1				1	8
6. Rheumatism and Gout	4	1		2	3		2	3													1	1				3			1	1	1		1					1			5
7. Diabetes		3		2	1		1	2							1								1	1												1		1			3
8. Other General Diseases	3	4		6	1		2	5					1			1								3	1	1					1		1	1	1		1	1	1		7
9. Alcoholism, Acute and Chronic	1			1			1																	1														1			1
Total	38	33		62	8	1	31	40		1		1	1		1	4	5	5	8	9	2	5	7	11	5	5	1		4	4	5	9	7	7	7	6	4	8	6	4	71
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1				1			1																		1							1								1
2. Simple Meningitis	2	11		13			11	1	1	5	1		1		1		1	1			2		1								3	2	1	1			1	2	1	2	13
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	10	2		4	8		2	10							1									2	1	7	1		1		2		1		1	1			4	2	12
5. Softening of the Brain																																									
6. Paralysis without specified cause	6	3		4	5			9																1	1	6		1	1		1		3	1		1		2			9
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	7	1		8			8			5	3																		2					1			1	1	2	1	8
10. Other Nervous Diseases	2	3		4	1		4	1							1			2				1			1							2		1		1	1				5
Total	28	20		33	15		25	22	1	10	4		1		3		1	3			2	1	1	3	3	14	1	1	4		6	4	6	4	1	3	3	5	7	5	48

VICTORIA.—*Continued.*

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis	1			1				1															1															1			1
3. Organic Heart Disease	12	14		11	15		4	22							1			1					1	3	6	10	4		3	2	1	1	3	1	3	1	3	6	2		26
4. Angina Pectoris																																									
5. Diseases of Arteries, Atheroma, Aneurism, etc.	1			1				1																			1						1								1
6. Other Diseases of the Circulatory System																																									
Total	14	14		13	15		4	24							1			1					2	3	6	10	5		3	2	1	1	4	1	3	1	3	7	2		28
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	6	3		7	2		4	5		3		1												1	1	3			1	1		1					1		3	2	9
2. Chronic Bronchitis																																									
3. Broncho-pneumonia	5			2	3		2	3		2														1	1		1						1					1	1	2	5
4. Pneumonia	10	6		10	6		5	11		2	1						1	1	1		1			1	6	1	1		1	2	5	1			1		3		1	2	16
5. Pleurisy		1		1			1										1																		1						1
6. Congestion of the Lungs, (inc. pul. apoplexy)	1				1		1				1																													1	1
7. Asthma and Emphysema	2			1	1			1	1																1	1												1		1	2
8. Other Diseases of the Respiratory System		1		1				1																	1															1	1
Total	24	11		22	13		13	21	1	7	2	1					2	1	1		1			3	10	5	2		2	3	5	2	1		2		4	2	5	9	35
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1			1				1															1											1							1
2. Other Diseases of Stomach (cancer excepted)	3	3		4	2		2	4							1				1						2	1	1					1		1	1	2				1	6
3. Infantile Diarrhœa and Cholera Infantum	2	2		4			4			3	1																					1		1	1	1					4
4. Diarrhœa and Enteritis (not infantile)	3	1		3	1		3	1				1	1		1											1						1		1	2						4
5. Dysentery																																									
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines		1		1			1																	1												1					1
8. Diseases of the Liver	2	2		1	3			4															1		2		1						1	1						2	4
9. Peritonitis (not puerperal)	2	5		5	2		3	4							1				2	2	1				1					1	2		1		1	1				1	7
10. Iliac Abscess and Appendicitis		4		4			4								1		1			1	1										1				2			1			4
Total	13	18		23	8		17	14		3	1	1	1		4		1		3	3	2		2	1	5	2	2			1	3	3	2	5	7	5		1		4	31
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	6			4	2		1	5												1				1	3		1			2				1	1	1		1			6
3. Other Diseases of the Kidneys and Adnexa		1		1				1												1												1									1
4. Vesical Calculi																																									
5. Diseases of the Bladder	2			1	1			2																	1	1			2												2
6. Diseases of the Male Genital Organs																																									
7. Metritis		1		1				1										1													1										1
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	8	2		7	3		1	9										1		2				1	4	1	1		2	2	1	1		1	1	1		1			10

VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicaemia																																								
2. Puerperal Albuminuria and Convulsions																																								
3. Other Accidents of Pregnancy, sudden death		2		1	1			2									1			1									1	1										2
4. Puerperal Disease of the Breast																																								
Total		2		1	1			2									1			1									1	1										2
IX. THE SKIN.																																								
1. Erysipelas																																								
2. Skin and Adnexa (cancer excepted)																																								
Total																																								
X. LOCOMOTOR SYSTEM.																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation for unspecified Diseases																																								
Total																																								
XI. MALFORMATIONS, ETC.																																								
1. Still-Births	7	7		11			14			14																		1	1	1	3	1	1	1		1	1	2	1	14
2. Congenital Debility and Malformations	15	19		31			31			4																		1	8	2		5	1	1	1	4	3	3	5	34
3. Other Diseases of Infancy	2			2			2				1	1																								1	1			2
4. Senile Decay	38	19		18	[illegible]	2	1	51	2															1	20	31	2	5	6	1	5	6	4	5	5	6	5	4	5	57
Total	62	45		68	37	2	61	51	2	18	1	1												1	20	31	2	7	15	1	8	12	6	7	6	12	10	9	11	107
XII. SUICIDE.																																								
1. Poison																																								
2. Strangulation	1			1				1															1																1	1
3. Gas Poisoning																																								
4. Drowning	1	1		1	1		2										1	1															1		1					2
5. Firearms																																								
6. Not stated	1			1				1														1																	1	1
Total	3	1		3	1		2	2									1	1				1	1										1		1				2	4
XIII. ACCIDENTS.																																								
1. Fractures and Dislocations	3	1		2	2		1	2	1													1	1	1		1								1		1		2		4
2. Gunshot																																								
3. Lightning																																								
4. Drowning	3	1			1	1		2														1	2				1					1		1	1		1			4
5. Tetanus	1				1		1											1																		1				1
6. Poison	1			1			1				1																										1			1
7. Railways	2			2			2									1											1				1		1							2
8. Burns and Scalds																																								
9. Homicide																																								
10. Other Accidents	3			2		1		2										1				1			1			1								2				3
Total	15	2		9	1	2	8	6	1		1					1		2				3	3	1	1	1	2	1			1	1	1	2	1	4	2	2		15
XIV. ILL DEFINED CAUSES.																																								
1. Dropsy	2	8		3	7		1	9															1	7	1	1		2				2	1	2			1	2		10
2. Tumors		2		1	1		1	1											1	1										1							1			2
3. Other Ill defined Causes	1					1			1															1													1			1
4. Heart Failure	3	3		6			1	1	1												1		2	3				2			2	1			1					6
Total	6	13		10	8	1	3	14	2										1	1	1		3	11	1	1		4		1	2	3	1	2	1		3	2		19
Total from all causes	220	171	.	269	116	6	170	214	7	70	10	8	4	3	4	11	14	15	15	10	7	16	31	46	61	51	5	32	32	30	33	36	27	34	26	31	40	33	37	391

CAUSES OF DEATHS BY COUNTIES IN 1904.—WATERLOO.—(Including municipalities of all classes).

General Diseases.	Sex: Male.	Sex: Female.	Sex: Not stated.	Nativity: Canada	Nativity: Foreign.	Nativity: Not stated.	Social cond: Single.	Social cond: Married.	Social cond: Not stated.	Ages (Under 5): 0.1.	Ages (Under 5): 1.	Ages (Under 5): 2.	Ages (Under 5): 3.	Ages (Under 5): 4.	Ages: 5-9.	Ages: 10-14.	Ages: 15-19.	Ages: 20-24.	Ages: 25-29.	Ages: 30-34.	Ages: 35-39.	Ages: 40-44.	Ages: 45-49.	Ages: 50-59.	Ages: 60-69.	Ages: 70-79.	Ages: 80 and over.	Ages: Not given.	Months: Jan.	Months: Feb.	Months: March.	Months: April.	Months: May.	Months: June.	Months: July.	Months: Aug.	Months: Sept.	Months: Oct.	Months: Nov.	Months: Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	4	3	....	6	1	....	4	2	1	....	.	.	.	.	..	2	.	2	1	..	..	..	..	.	1	.	1	..	.	1	1	1	1	.	.	1	.	1	1		7
2. Smallpox	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
3. Measles	....	1	....	1	....	....	1	....	....	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	..	1	.	.	.	.	.	.	.	.	.	.	1
4. Scarlet Fever	2	1	....	3	....	....	2	....	1	....	..	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	1	1	.	.	3
5. Whooping Cough	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
6. Diphtheria and Croup	6	5	....	11	....	....	11	....	....	3	.	2	.	1	4	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	4	.	3	2	11
7. Influenza	6	8	....	5	9	....	2	11	1	1	.	.	.	.	.	.	1	.	1	1	.	.	.	.	.	6	4	.	5	3	4	.	.	.	.	.	.	1	.	1	14
8. Other Epidemic Diseases	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
Total	18	18	....	26	10	.	20	13	3	5	..	4	.	1	4	2	2	2	2	1	..	.	.	.	1	6	5	1	5	5	5	2	1	.	2	1	5	3	4	3	36
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	2	....	4	....	....	1	2	1	....	.	.	.	.	.	.	1	..	1	.	.	.	.	1	..	1	.	.	.	.	.	.	1	1	.	.	1	1	.	.	4
2. Malarial Fever	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
3. Tuberculosis and Scrofula	15	21	....	32	2	2	20	11	5	....	2	..	.	.	.	.	7	5	9	2	4	.	2	1	3	1	.	.	1	1	3	2	4	4	4	3	3	6	3	2	36
4. Syphilis	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
5. Cancer	15	14	....	14	14	1	3	21	5	....	.	.	.	.	.	.	.	..	1	2	..	1	3	4	9	8	1	.	3	1	3	1	3	2	2	3	3	5	.	3	29
6. Rheumatism and Gout	2	1	....	1	2	....	....	3	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	1	.	..	1	.	1	.	.	.	.	.	.	1	.	3
7. Diabetes	....	1	....	....	1	....	....	1	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1
8. Other General Diseases	2	2	....	3	1	....	2	2	....	....	.	.	.	.	.	1	..	1	..	.	.	.	.	1	1	.	.	.	..	1	.	1	.	1	.	1	.	.	.	..	4
9. Alcoholism, Acute and Chronic	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
Total	36	41	....	51	20	3	26	40	11	....	2	..	..	..	.	1	8	6	11	4	4	1	5	9	14	10	2	.	4	4	6	5	8	8	6	7	8	12	4	6	77
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2	....	....	1	1	....	1	1	....	1	..	.	.	.	.	.	.	.	.	.	.	.	.	.	1	..	..	..	..	1	1	..	.	.	.	.	.	.	.	.	2
2. Simple Meningitis	5	4	....	8	1	....	7	2	....	3	1	..	.	2	..	1	.	.	.	.	.	1	..	1	..	.	.	..	2	.	3	..	1	1	1	1	.	.	.	.	9
3. Epidemic Cerebro-spinal Meningitis	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
4. Congestion and Hemorrhage of Brain	13	11	....	8	15	1	2	13	9	....	.	.	.	.	.	.	..	1	..	2	..	1	..	3	3	9	5	..	4	1	2	3	2	1	1	1	2	2	4	1	24
5. Softening of the Brain	....	1	....	1	....	....	....	1	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	1	..	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1
6. Paralysis without specified cause	9	6	....	8	6	1	1	10	4	....	.	.	.	.	.	.	.	.	.	.	1	..	1	3	6	2	2	..	1	3	1	1	..	1	1	2	1	..	1	3	15
7. Insanity	....	....	....	....	....	....	....	....	....	....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	......
8. Epilepsy	....	1	....	1	....	....	....	1	....	....	.	.	.	.	.	.	.	.	.	.	.	.	1	..	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1
9. Convulsions (not puerperal)	11	10	....	21	....	....	21	....	....	17	2	2	..	.	..	.	.	.	.	.	.	.	.	.	.	.	.	..	1	1	2	4	1	2	1	5	3	1	..	..	21
10. Other Nervous Diseases	5	4	....	8	1	....	3	5	1	1	.	.	.	.	..	1	..	2	..	.	1	..	1	2	..	1	..	..	1	..	1	3	1	1	1	.	1	..	..	.	9
Total	45	37	....	56	24	2	35	33	14	22	3	2	..	2	..	2	..	3	..	2	2	2	3	10	10	12	7	..	9	6	10	11	6	6	5	9	7	4	5	4	82

IV. CIRCULATORY SYSTEM.											
1. Pericarditis	....	....	....	....	....	....	....	....	....	....	....
2. Endocarditis	....	1	....	....	1	....	....	1	....	1 1	1
3. Organic Heart Diseases	18	29	....	18	24	5	5	30	12	3 2 2 1 2 6 2 9 14 5 1 4 1 4 7 8 5 3 5 3 1 4 2	47
4. Angina Pectoris	....	....	....	....	....	....	....	....	....	....	....
5. Arteries, Atheroma, Aneurism, etc.	4	2	....	3	3	....	2	3	1	1 1 2 1 1 1 1 2 1 1	6
6. Other Diseases of Circulatory System	....	....	....	....	....	....	....	....	....	....	....
Total	22	32	...	21	28	5	7	34	13	3 2 3 2 2 7 4 10 15 5 1 4 2 5 9 9 5 3 5 4 1 4 3	54
V. RESPIRATORY SYSTEM											
1. Acute Bronchitis	3	6	....	5	4	....	3	5	1	2 1 1 2 1 1 1 3 3 1 1 1	9
2. Chronic Bronchitis	1	2	....	...	3	....	....	3	....	3 1 1 1	5
3. Broncho-pneumonia	5	5	....	8	2	....	7	3	...	2 3 1 1 1 2 1 5 1 1 1	10
4. Pneumonia	12	13	....	17	8	....	12	11	2	4 3 1 1 2 1 1 2 3 1 4 2 4 7 1 1 4 1 2 2	25
5. Pleurisy	3	....	....	2	1	....	3	....	....	1 1 1 1 2	3
6. Congestion of the Lungs	4	3	....	4	2	1	3	3	1	1 1 1 1 1 1 1 2 1 3 1	7
7. Asthma and Emphysema	1	1	....	....	2	..	...	2	....	1 1 1 1	2
8. Other Diseases of Respiratory System	....	....	....	....	....	....	....	....	....	....	....
Total	29	30	....	36	22	1	28	27	4	9 7 4 1 2 3 2 1 1 2 4 4 13 5 1 10 12 6 4 5 10 1 4 3 1 5	59
VI. DIGESTIVE SYSTEM											
1. Ulcer of the Stomach	1	1	...	1	....	1	1	....	1	1 1 1 1	2
2. Other Diseases of Stomach (cancer excepted)	3	2	....	3	2	....	...	5	....	1 1 2 1 1 1 1 1 1	5
3. Infan. Diarrhoea and Cholera Infantum	7	3	..	10	..	....	10	....	....	7 3 3 4 1 2	10
4. Diarrhoea and Enteritis (not infantile)	2	4	...	2	1	....	2	3	1	1 1 1 1 2 1 1 1 1 2	6
5. Dysentery	....	....	....	....	....	....	....	....	....	....	....
6. Hernia and Intestinal obstructions	3	2	..	2	3	....	2	3	...	1 1 3 1 1 2	5
7. Other Diseases of the Intestines	2	2	..	3	1	...	2	2	...	1 1 1 1 1 1 1	4
8. Diseases of the Liver	2	2	..	3	1	...	..	3	1	1 3 1 1 1 1	4
9. Peritonitis (not puerperal)	2	2	..	5	1	...	..	4	...	1 1 1 1 1 3	4
10. Iliac Abscess and Appendicitis	5	2	..	6	..	1	4	2	1	1 1 1 1 2 1 2 2 1 1 1	7
Total	27	20	....	33	12	2	21	22	4	7 3 1 1 2 1 2 1 3 4 1 2 5 5 6 2 1 3 5 6 2 6 4 3 2 7 2 5 2	47
VII. GENITO-URINARY SYSTEM											
1. Acute Nephritis	3	1	....	.	2	...	1	3	....	1 1 2 1 1 1 1	4
2. Bright's Disease	8	3	....	7	1	..	3	10	2	3 1 2 1 4 1 2 1 1 2 1	11
3. Other Diseases of Kidneys and Adnexa	....	....	....	....	....	....	....	....	....	....	....
4. Vesical Calculi	....	....	....	....	....	....	....	....	....	....	....
5. Diseases of the Bladder	1	...	..	....	1	...	...	1	....	1 1	1
6. Diseases of the Male Genital Organs	...	....	....	....	....	....	....	....	....	....	....
7. Metritis	....	....	....	....	....	....	....	....	....	....	....
8. Other Diseases of the Uterus	....	....	....	....	....	....	....	....	....	....	....
9. Ovarian Cysts and other Ovarian Tumors	....	....	....	....	....	....	....	....	....	....	....
10. Other Diseases of the Female Genital Organs	....	....	....	....	....	....	....	....	....	....	....
Total	12	4	...	9	7	...	4	10	2	3 1 3 2 3 4 2 1 2 2 5 2 1 1	16
VIII. PUERPERAL DISEASES											
1. Puerperal Septicemia	....	....	....	....	....	....	....	....	....	....	....
2. Puerperal Albuminuria and Convulsions	.	2	....	2	....	....	...	2	...	1 1 1 1	2
3. Other accidents of Pregnancy, sudden death	....	1	....	1	....	....	....	1	...	1 1	1
4. Puerperal Disease of the Breast	....	....	....	....	....	....	....	....	....	....	....
Total	....	3	....	3	....	....	...	3	...	1 1 1 1 1 1	3

WATERLOO.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN																																									
1. Erysipelas					1	1		2													1				1					1							1				2
2. Skin and Adnexa (cancer excepted)																																									
Total	2				1	1		2													1				1					1							1				2
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints	1				1			1																1															1		1
3. Amputation (for unspecified disease)																																									
Total	1				1			1																1															1		1
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	1	9		22			22			22																			1	2	4	2	2	1	1	2	2	2	1	2	22
2. Congen. Debil. and Malformations		30		6			62			62																			3	2	6	3	7	5		2	9	12	8	5	62
3. Other Diseases of Infancy																																									
4. Senile Decay	[illegible]	11		12	79	1	9	70	11																4	32	56	1	10	9	7	5	6	7	10	4	12	10	7	6	93
Total	[illegible]	[illegible]		[illegible]	79	1	9	70	11	84															4	32	56	1	14	13	17	10	15	13	11	8	23	24	16	13	177
XII. SUICIDE																																									
1. Poison		1		1				1																	1												1				1
2. Strangulation	2			2				1	1														1		1								1			1					2
3. Gas Poisoning	1			1				1															1							1											1
4. Drowning																																									
5. Firearms																																									
6. Not stated	2	1		2	1			1	2									1		1					1										2	1					3
Total	5	2		6	1			4	3									1		1			2		3					1			1		2	2	1				7
XIII. ACCIDENTS																																									
1. Fractures and Dislocations	[illegible]	5		1			2		2	1														2		1			1					1			1			1	4
2. Gunshot																																									
3. Lightning																																									
4. Drowning	1			1			1									1																		1							1
5. Electric Cars	1				1				1																		1							1							1
6. Bicycles																																									
7. Railways					2				2										1				1														1			1	2
8. Burns and Scalds		3		2	1		2	1				1			1											1						1			1			1			3
9. Homicide																																									
10. Other accidents	9			9	1	1	5	3	3						1		1	1	1	1	2	1	1	2					1	1	2			1		4		1		1	11
Total	14	8		15	8	1	10	4	8	1		1			2	1	1	1	2	1	2	1	2	4		2	1		2	1	2	1		4	1	4	2	2		3	22
XIV. ILL DEFINED CAUSES																																									
1. Dropsy	6	5			6			10	1															2	1	7	1		1	1	4	1		1	1			1	1		11
2. Tumors	1	4		4	1		3	2								1			2	1			1						2				1							2	5
3. Other Ill-Defined Causes	5	2		1	2	1	1	6												1		1	1		2	1	1		1	1		1	1		1					2	7
4. Heart Failure	1	3		7			3	4										1		1		1		2	2								1	1	1		1	1	1	1	7
Total	16	14		20	9	1	7	22	1							1		1	2	3		2	2	4	5	8	2		4	2	4	2	3	2	3		1	2	2	5	30
Total from all causes	321	292	..	374	222	17	251	285	77	128	15	7	5	4	9	8	18	23	24	21	13	9	25	44	59	107	89	5	55	52	63	48	56	52	40	38	69	55	43	42	613

CAUSES OF DEATHS BY COUNTIES IN 1904.—WELLAND.—(Including municipalities of all classes).

Sex: cols 1–3; Nativity: cols 4–6; Social con.: cols 7–9; Ages (Under 5: cols 10–14): cols 10–28; Months: cols 29–40.

General Diseases	Male	Female	Not stated	Canada	Foreign	Not stated	Single	Married	Not stated	0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	January	February	March	April	May	June	July	August	September	October	November	December	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES																																									
1. Typhoid Fever	2	3		5			2	3									1	2		2									1						2			1		1	5
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	6		8			7	1		1			1	1	2	1		1	1										3	1	3									1	8
5. Whooping Cough	1			1			1								1															1											1
6. Diphtheria and Croup	7	5		12			12				2	3		1	1	2	1	1				1							2	1						4	3	1		1	12
7. Influenza	2	2		3	1		1	3		1														1		2				1	2									1	4
8. Other Epidemic Diseases																																									
Total	14	16		29	1		23	7		2	2	3	1	2	4	3	2	4	1	2		1		1		2			6	4	5				2	4	3	2		4	30
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia	1	3		2	2		1	3													1			2			1		2			2									4
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	15	21		30	6		11	21	1				1	1	1	2	1	4	5	5	2	4	1	3	5	3			4		4	4	3	2	3	3	3	3	2	5	36
4. Syphilis																																									
5. Cancer	1	7		7	1		1	7											1		1			1	2	2	1				3	1		1	1		1		1		8
6. Rheumatism and Gout		1		1				1																		1													1		1
7. Diabetes	3			3				2	1											1					2					1				2							3
8. Other General Diseases		3		3			1	2											1					2						1		1							1		3
9. Alcoholism, Acute and Chronic		1		1				1														1										1									1
Total	25	33		47	9		14	40	2				1	1	1	2	1	4	7	4	4	5	1	8	9	6	2		6	2	7	9	3	5	4	3	4	3	5	5	56
Local Diseases.																																									
III. NERVOUS SYSTEM																																									
1. Encephalitis	4	2		5	1		5		1	2		1			1	1				1									2		1				1	1				1	6
2. Simple Meningitis	3	1		4			3	1		1						2				1											1	1	1						1		4
3. Epidemic Cerebro-spinal Meningitis		1			1		1									1															1										1
4. Congestion and Hemorrhage of the Brain	5	5		9	1		1	8	1														1	1	3	1	3	1	2	2	2	2						1		1	10
5. Softening of the Brain	1	1		1	1			1	1																2								2								2
6. Paralysis without specified cause	9	10		12	7		3	16													1		1		5	8	4			1	2		1		1	2	4	5	2	1	19
7. Insanity																																									
8. Epilepsy		2			2		1	1											1						1						2										2
9. Convulsions (not puerperal)	6	5		11			11			11																			2	2		1		3		1			1	1	11
10. Other Nervous Diseases	2			2				2																	1	1					2										2
Total	30	27		44	13		25	29	3	14		1			1	4			1	2	1		2	1	12	10	7	1	6	5	11	4	4	3	2	4	4	6	4	4	57

WELLAND.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis	1	1		2			1	1																		2									1			1			2
3. Organic Heart Diseases	13	9		13	9		3	14	5						1								1		8	10	2		2	3	1	4	1	4	1	1	1	2		2	22
4. Angina Pectoris		1		1				1																	1												1				1
5. Diseases of Arteries, Atheroma, Aneurism, etc.		2			2			2																1		1								1			1				2
6. Other Diseases of Circulatory System																																									
Total	14	13		16	11		4	18	5						1								1	1	9	13	2		2	3	1	4	1	5	2	1	3	3		2	27
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	6	3		3	6		3	4	2								1								2	4	2			1	2	1	1		1	1		1	1		9
2. Chronic Bronchitis																																									
3. Broncho Pneumonia	1	1		2			1	1		1															1				1		1										2
4. Pneumonia	15	10		15	10		5	18	2	2	1				1					2	1	1	4	1	1	4	7		3	1	7	1		2	1			5	3	2	25
5. Pleurisy		1			1			1																	1											1					1
6. Congestion of the lungs (inc. pul. apoplexy)	2			1	1		1	1																1		1				1			1								2
7. Asthma and Emphysema	2			2			2																			2			2												2
8. Other Diseases of the Respiratory System																																									
Total	26	15		23	18		12	25	4	3	1				1		1			2	1	1	4	2	5	11	9		6	3	10	2	2	2	2	2		6	4	2	41
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1				1				1											1										1											1
2. Other Dis's. of the Stomach (cancer excepted)		2		2				2																1	1											1		1			2
3. Infan. Diarr. and Cholera Infantum	8	5		13			13			13																					1					4	7	1			13
4. Diarrhœa and Enteritis (not Infantile)	2	1		3			2	1				2												1					1							2					3
5. Dysentery		2			2			2																		1	1								1		1				2
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	2	3		3	1	1	2	3												1					1	2	1						1	1	1	1				1	5
9. Peritonitis (not puerperal)		1			1			1																	1													1			1
10. Iliac Abscess and Appendicitis	6	1		7			7									6	1												1					3		2	1				7
Total	19	15		28	5	1	21	9	1	13		2				6	1			2				2	3	3	2		2	1	1		1	1	2	10	9	3		1	31
VII. GENITO URINARY SYSTEM.																																									
1. Acute Nephritis	3			2	1		2	1		1															1	1				1			1							1	3
2. Bright's Disease	5	4		9			4	5		1									1			1		1	2	3			2		2				1	1		2		1	9
3. Other Diseases of Kidneys and Adnexa	5			4	1			5																		5				1			2					2			5
4. Vesical Calculi																																									
5. Diseases of the Bladder	2	1		2	1			3															1			1	1								1	1		1			3
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	15	5		17	3		6	14		2									1			1	1	1	3	10	1		2	2	2		3		2	2		5		2	20

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions		2		2				2											1		1												1						1		2
3. Other Accidents of Pregnancy, sudden death		4		3	1			4											1	1	2										1			1	1				1		4
4. Puerperal Diseases of the Breast																																									
Total		6		5	1			6											2	1	3										1		1	1	1				2		6
IX. THE SKIN.																																									
1. Erysipelas		1			1			1																		1						1									1
2. Skin and Adnexa (cancer excepted)																																									
Total		1			1			1																		1						1									1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified disease)																																									
Total																																									
XI. MALFORMATIONS, ETC																																									
1. Still Births	10	12		22			22			22																			1	1	5	1	4	1	3	1	1	1	1	2	22
2. Congen. Debility and Malformation	23	9		32			32			32																			2	1	5	1	4	4	4	3	2	3	1	2	32
3. Other Diseases of Infancy																																									
4. Senile Decay	57	35		42	49	1	13	74	5																8	34	49	1	8	11	12	8	8	8	5	7	7	2	4	12	92
Total	90	56		96	49	1	67	74	5	54															8	34	49	1	11	13	22	10	16	13	12	11	10	6	6	16	146
XII. SUICIDE																																									
1. Poison																																									
2. Strangulation	1			1				1																	1								1								1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms	1					1		1																	1											1					1
6. Not Stated	2			2			2																	1		1			1									1			2
Total	4			3		1	2	2																1	2	1			1				1			1		1			4
XIII. ACCIDENT.																																									
1. Fractures and Dislocations	6	1		5	2		2	5						1				2	1		1	2												1	2	1			1	2	7
2. Gunshot																																									
3. Lightning	2			2			1	1											1		1														1		1				2
4. Drowning	10	2		5	7		8	3	1							2	3	2	2	3														4	2	1	1	2		2	12
5. Asphyxiation	2			1	1		1	1										1				1																1	1		2
6. Bicycles																																									
7. Railways	10			5	4	1	3	6	1									3			1	2	2	1	1						1	1	1		1	1	1	1		3	10
8. Burns and Scalds	1			1			1					1																			1										1
9. Homicide																																									
10. Other Accidents	19			12	7		8	9	2	1		1			1		1	2	3	3	4	1		1	1					3	1		2	3	1	3	2			4	19
Total	50	3		31	21	1	24	25	4	1		2		1	1	2	4	10	7	6	7	6	2	2	2					3	3	1	3	8	7	6	5	4	2	11	53
XIV. ILL-DEFINED CAUSES																																									
1. Dropsy		2		2			2																			2							1							1	2
2. Tumors	1	1		2			1	1								1					1										1		1								2
3. Other Ill-Defined Causes	2	1		3			1	2											1				1	1							1					1				1	3
4. Heart Failure	10	10		16	4		4	15	1							2		3	1	1		1	1	6	5				1	2	4	2	1	1	2	3		2		2	20
Total	13	14		23	4		8	18	1							3		3	2	1	1	1	2	7	5	2			1	2	6	2	3	1	2	4		2		4	27
Total from all causes	298	204	...	362	136	4	209	268	25	89	3	8	2	4	9	20	9	21	21	20	17	15	13	26	58	93	72	2	43	38	69	33	38	42	38	48	38	41	23	51	502

CAUSES OF DEATHS BY COUNTIES IN 1904.—WELLINGTON.—(Including Municipalities of all Classes).

General Diseases.

	Sex.			Nativity.			Soc'l con.		
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.
Number of column.	1	2	3	4	5	6	7	8	9
I. COMMUNICABLE (EPIDEMIC) DISEASES.									
1. Typhoid Fever	5	2		7			5	2	
2. Smallpox									
3. Measles									
4. Scarlet Fever	1	3		4			4		
5. Whooping Cough									
6. Diphtheria and Croup	6	1		7			6	1	
7. Influenza	2	7		5	4		2	7	
8. Other Epidemic Diseases									
Total	11	13		23	4		17	10	
II. OTHER GENERAL DISEASES.									
1. Pyaemia and Septicaemia	4			3		1	2	2	
2. Malarial Fever									
3. Tuberculosis and Scrofula	25	31		47	8	1	27	27	2
4. Syphilis									
5. Cancer	15	21		14	20	2	6	29	1
6. Rheumatism and Gout		1			1			1	
7. Diabetes	1	3		4			2	2	
8. Other General Diseases	5	7		11	1		3	9	
9. Alcoholism, Acute and Chronic									
Total	50	63		79	30	1	40	70	5
Local Diseases.									
III. NERVOUS SYSTEM.									
1. Encephalitis	2			1	1		1	1	
2. Simple Meningitis	8	1		9			8	1	
3. Epidemic Cerebro-spinal Meningitis	1			1			1		
4. Congestion and Hemorrhage of the Brain	14	14		11	17		6	22	
5. Softening of the Brain									
6. Paralysis without specified cause	19	19		13	24	1	7	31	
7. Insanity	1				1			1	
8. Epilepsy	4			4			2		2
9. Convulsions (not puerperal)	9	6		15			15		
10. Other Nervous Diseases	1	3		3	1		1	3	
Total	59	43		57	44	1	41	59	2

	Ages. Under 5.																		
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given
Number of column.	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
I. COMMUNICABLE (EPIDEMIC) DISEASES.																			
1. Typhoid Fever							1	2	1	1					2				
2. Smallpox																			
3. Measles																			
4. Scarlet Fever				1	1	2													
5. Whooping Cough																			
6. Diphtheria and Croup	1	1	1			1	1			1		1							
7. Influenza	1					1											3	4	
8. Other Epidemic Diseases																			
Total	2	1	1	1	1	4	2	2	1	2		1			2		3	4	
II. OTHER GENERAL DISEASES.																			
1. Pyaemia and Septicaemia			1			1							1			1			
2. Malarial Fever																			
3. Tuberculosis and Scrofula		2				2	1		9	8	6	8	4	4	2	5	2	1	2
4. Syphilis																			
5. Cancer											1	1	1	1	8	11	9	3	1
6. Rheumatism and Gout																	1		
7. Diabetes				1				1							2				
8. Other General Diseases			1				1			3	1	2		2		2			
9. Alcoholism, Acute and Chronic																			
Total		2	2	1		3	2	1	9	11	8	11	6	7	12	19	12	4	3
Local Diseases.																			
III. NERVOUS SYSTEM.																			
1. Encephalitis				1												1			
2. Simple Meningitis	2	1			2	1	2								1				
3. Epidemic Cerebro-spinal Meningitis						1													
4. Congestion and Hemorrhage of the Brain										1	1		1	2	3	6	10	4	
5. Softening of the Brain																			
6. Paralysis without specified cause											2	2	1	1	3	4	12	12	1
7. Insanity																	1		
8. Epilepsy										1	1				1				1
9. Convulsions (not puerperal)	12		1	1															1
10. Other Nervous Diseases		1							1							2			
Total	14	2	1	2	2	2	2		1	2	4	2	2	3	8	13	23	16	3

	Months.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Number of column.	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.													
1. Typhoid Fever	1							2	2	1		1	7
2. Smallpox													
3. Measles													
4. Scarlet Fever			3	1									4
5. Whooping Cough													
6. Diphtheria and Croup	2	1					1			1	2		7
7. Influenza	6	2	1										9
8. Other Epidemic Diseases													
Total	9	3	4	1			1	2	2	2	2	1	27
II. OTHER GENERAL DISEASES.													
1. Pyaemia and Septicaemia	1		1		1	1							4
2. Malarial Fever													
3. Tuberculosis and Scrofula	5	5	3	6	3	7	2	5	2	8	3	7	56
4. Syphilis													
5. Cancer	4	2	5	4	1	3	2	4	3	4	3	1	36
6. Rheumatism and Gout							1						1
7. Diabetes					1		2					1	4
8. Other General Diseases		2	2	4		1	1	2					12
9. Alcoholism, Acute and Chronic													
Total	10	9	11	14	6	12	8	11	5	12	6	9	113
Local Diseases.													
III. NERVOUS SYSTEM.													
1. Encephalitis									2				2
2. Simple Meningitis		1	1	1	1	3	1		1				9
3. Epidemic Cerebro-spinal Meningitis							1						1
4. Congestion and Hemorrhage of the Brain	2	5	1	5	2	2	1	1	3	4		2	28
5. Softening of the Brain													
6. Paralysis without specified cause	5	3	1	2	4	1	5	4	4	2	3	4	38
7. Insanity		1											1
8. Epilepsy			1				1	2					4
9. Convulsions (not puerperal)		4	2		1		4	2	1			1	15
10. Other Nervous Diseases			1	1			1		1				4
Total	7	14	7	9	8	6	14	9	12	6	3	7	102

IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis	2	1		3			1	2									1	1	1											1									2		3
3. Organic Heart Diseases	20	27		27	20		9	37	1							1		1	1	2	2	2	4	6	11	14	3		3	6	3	2	5	3	2	5	3	7	5	3	47
4. Angina Pectoris	2	1		1	2			3																1	2					1				1			1				3
5. Arteries, Atheroma, Aneurism, etc.	1				1			1																	1				1												1
6. Other Diseases of Circulatory System	1			1			1														1														1						1
Total	26	29		32	23		11	43	1							1	1	2	2	2	3	2	4	7	14	14	3		4	8	3	2	6	4	3	5	4	7	7	3	55
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	3	5		5	3		4	4		2	1								1						2	1	1		2				2	2				1		1	8
2. Chronic Bronchitis	1	2			3			3																	1	2				1								1		1	3
3. Broncho-pneumonia	3	4		4	3		4	3		1	2						1									2	1			2		2	1				2				7
4. Pneumonia	17	15		21	11		14	18		2	2						2	1	1	4	1			4	5	9	1		5	4	5	5	3	1	1	1	2		3	2	32
5. Pleurisy	3	3		4	2		2	1		1							1			1	1				2				1		1					1			1	2	6
6. Congestion of the Lungs, (inc. pul. apoplexy)	3	4		4	3		2	4	1					1				1	1					2	1	1				3	1			1	1					1	7
7. Asthma and Emphysema	1	1			2		1	1																	1		1							1			1				2
8. Other Diseases of Respiratory System																																									
Total	31	34		38	27		27	37	1	6	5			1			4	2	3	5	2			6	12	15	4		8	10	7	7	6	5	2	2	5	2	4	7	65
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1	1			2		1	1													1				1									1		1					2
2. Other Dis's. of the Stomach (cancer excepted)	3	5		5	3		2	6										1		1		2			3	1			1	1	1	1			1	1		1		1	8
3. Infant. Diarr. and Cholera Infantum	8	7		15			15			14	1																		1				1	2	1	4	5	1			15
4. Diarrhoea and Enteritis (not Infantile)	1	3		2	2		1	3								1									2		1		1			1			1		1				4
5. Dysentery		1		1				1																		1											1				1
6. Hernia and Intestinal obstructions	3	1		1	4	1	2	3	1									1		1					1	3				1	1	1		1			2				6
7. Other Diseases of the Intestines	2	1		2	1			3															1		1		1		1							1	1				3
8. Diseases of the Liver	6	3		4	5		1	8													1	1	1		4	1	1		1		1	3	2		1			1			9
9. Peritonitis (not puerperal)	2	6		5	3		3	5		1							2	1	1					2		1						1		1		3	1	2			8
10. Iliac Abscess and Appendicitis	7	3		10			7	3					1		2	3	1	1	1						1						1			2	2	1	2		2		10
Total	3	31		45	20	1	32	33	1	15	1		1		2	4	3	4	2	2	2	3	2	2	15	7	3		5	2	4	7	3	7	6	11	13	5	2	1	66
VII. GENITO URINARY SYSTEM.																																									
1. Acute Nephritis	3	2		3	2		2	3																3		1	1					2	1			1	1				5
2. Bright's Disease	4	10		10	4		3	11					1		1				1		1		2	2		4	1	1		3	1	1		2	1	1			1	4	14
3. Other Diseases of Kidneys and Adnexa	1			1			1												1												1										1
4. Vesical Calculi	1			1				1																	1						1										1
5. Diseases of the Bladder	7	1		2	6		1	7												1						3	3	1	1		1		2	2			1		1		8
6. Diseases of the Male Genital Organs	1				1			1																		1												1			1
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	17	13		17	13		7	23					1		1				2	1	1		2	5	1	9	5	2	1	3	4	3	3	4	1	2	2	1	2	4	30
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		2		2				2														2								1			1								2
2. Puerperal Albuminuria and Convulsions		1		1				1													1										1										1
3. Other Accidents of Pregnancy, sudden death		2		2				2													1	1								1						1					2
4. Puerperal Disease of the Breast																																									
Total		5		5				5													2	3								2	1		1			1					5

WELLINGTON.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation for unspecified Diseases																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	18	17	1	36			36			36																			2	4	5	4	1	6	2	2	4		4	2	36
2. Congen. Debil. and Malformations	40	26		66			66			66																			3	5	5	7	10	2	6	12	5	4	5	2	66
3. Other diseases of Infancy	1			1			1								1																							1			1
4. Senile Decay	67	52		11	105		10	106	3																6	36	73	4	16	13	7	12	10	8	8	5	5	8	13	14	119
Total	126	95	1	117	105		113	106	5	102					1										6	36	73	4	21	22	17	23	21	16	16	19	11	13	22	18	222
XII. SUICIDE.																																									
1. Poison		1		1				1														1										1									1
2. Strangulation		1			1			1															1													1					1
3. Gas Poisoning																																									
4. Drowning	3			3			2	1										2	1														2					1			3
5. Firearms																																									
Total	3	2		4	1		2	3										2	1			1	1									1	2			1		1			5
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	5	1		4	2		2	3	1																		1	2	1						1				1	3	6
2. Gunshot	1	1		2			1	1									1				1									1			1								2
3. Lightning																																									
4. Drowning	2			1	1		1	1										1							1								1		1						2
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	5	1		4	2		6											2	1	1			2									2		2			1			1	6
8. Burns and Scalds																																									
9. Other accidents	11	2		8	5		9	4		2					1	3					1		2	1	1	1	1					2	3		1	2		1	2	2	13
10. Asphyxiation	1			1			1											1																			1				1
Total	25	5		20	10		20	9	1	2					1	3	1	4	1	1	2		4	1	2	1	2	2	1	1		4	5	2	3	2	2	1	3	6	30
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	2	4		2	4			6																1	1	2	2							1	2	1			1	1	6
2. Tumors	3	4		4	3		3	4									1	1		1	1			1	1		1		2				1	1			1		1	1	7
3. Other Ill-defined Causes	5	1		4	1	1	2	3	1		1							1						1	1	1		1				1	2		2				1		6
4. Heart Failure	5	11		13	3		6	16				1					1		2			4	1	2	5				1	4	1	2	5					1	1	1	16
Total	15	20		23	11	1	11	23	1		1	1					2	2	2	1	1	4	1	3	8	3	3	1	3	4	1	3	8	2	4	1	1	1	4	3	35
Total from all causes	401	353	1	460	288	7	321	421	13	141	12	5	6	4	14	14	14	27	28	24	27	21	24	48	68	126	117	15	69	78	59	74	68	58	58	66	60	51	55	59	755

CAUSES OF DEATHS BY COUNTIES IN 1904.—WENTWORTH.—(Including municipalities of all classes).

General Diseases.	Sex.			Nativity.			Soc'l con.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over.	Not given.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	10	1		7	4		6	4	1	1									2	2		1	1					1		1		3	1				3	2		1	11
2. Smallpox																																									......
3. Measles																																									......
4. Scarlet Fever	2	4		4	2		6				2		3		1															3		2						1			6
5. Whooping Cough	3	1		4			4			4																										2	1	1			4
6. Diphtheria and Croup	11	7		15	3		17	1		1		3	1	1	7		1					1							1	2		2	2	3	1	1		2	1	3	18
7. Influenza	6	9		9	6		3	11	1	1					1									1	3	3	5	1	4	6	2									3	15
8. Other Epidemic Diseases																																									......
Total	32	22		39	15		36	16	2	7	2	3	7	1	9		1	5	2	2		2	1	1	3	3	3	2	5	12	2	7	5	5	1	3	4	6	1	7	51
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	4		4	2			6										1	1	1	1			1	1				1	1	1		1	1						1	6
2. Malarial Fever																																									......
3. Tuberculosis and Scrofula	76	59		96	37	2	63	67	5					1	1		9	5	18	10	23	12	6	16	6	4	1		15	11	18	7	4	7	12	10	9	18	8	8	155
4. Syphilis																																									......
5. Cancer	21	42		22	46	1	4	63	2								1	1		1	3	5	7	20	13	11	6	1	6	8	11	5	6	7		1	3	1	5	6	69
6. Rheumatism and Gout	2	6		6	2		2	6							1					1	1			3	1	1			1		1	1	1	1	1		1		1		8
7. Diabetes	2	2		2	2		1	3										2			1			1					1						1		1			1	4
8. Other General Diseases	7	6		5	8			13											1			1	1	3	5	1	1				3		2	1		1	1	1	1	3	13
9. Alcoholism, Acute and Chronic																																									......
Total	116	119		135	97	3	70	158	7					1	5		10	29	20	3	29	18	11	14	26	17	8	1	22	20	31	23	14	17	21	15	15	20	15	19	255
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2	2		2	1	1	2	2									1	1						1			1		1		1					1				1	4
2. Simple Meningitis	12	11		20	3		20	3		7	2	1	1		1	2	2	1		2	1			2		1			2	2	1	1	1	2	2	3	2	2	1	4	23
3. Epidemic Cerebro-spinal Meningitis	3			1	2		2	1					1					1		1												1								2	3
4. Congestion and Hemorrhage of the Brain	35	30		20	45		10	55											1	1	2	3	3	7	11	29	5		5	9	1	5	1	2	6	8	9	4	7	8	65
5. Softening of the Brain	3	6		4	4	1	1	8												2					3	3	1			1	1	1		1		2			3		9
6. Paralysis without specified cause	18	14		17	15		6	25	1								1	2	1	1	1	1	5	2	5	11	2		2	3	1	2	3	2	3	..	1	2	3	7	32
7. Insanity	5	2		4	3		3	4														1		3	3				1			1	1		1	1		2			7
8. Epilepsy	5	4		6	1	2	5	3	1									1	2		1		1	3				1	1	1		1	1		1		1	1	1	1	9
9. Convulsions (not puerperal)	5	6		9	2		9	1	1	5	2	1	1									1				1			3	1		1	3		1	2					11
10. Other Nervous Diseases	3	5		7	1		3	5										1					1	2	3		1			3	2				1	1	1				8
Total	91	80		90	77	4	61	107	3	12	4	2	3	..	1	2	4	7	4	7	5	6	10	20	28	45	10	1	15	20	10	13	10	7	15	18	11	11	15	23	171

WENTWORTH.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis	2	1		2	1		1	2								1													1						1				1		3
2. Endocarditis	2	3		5			4	1							2	1	1						1						2				1			1		1			5
3. Organic Heart Diseases	35	39		33	40	1	18	53	3			1			2	2	3	1	2	3	5	2	5	3	17	13	8	4	6	14	10	9	7	5	3		5	3	6	6	74
4. Angina Pectoris	1	1		1		1	1		1									1						1					1		1										2
5. Arteries, Atheroma, Aneurism, etc.	6	5		2	9		2	8	1															2	1	1	4		1	1		1	3		2	3					11
6. Other Diseases of Circulatory System																																									
Total	46	49		43	50	2	26	64	5			1			4	4	4	5	2	3	5	2	6	6	20	17	12	4	11	15	11	10	11	5	6	4	5	4	7	6	95
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	8	13		15	6		10	10	1	9	1										1			2	2	8	3		4	4	1	1	5				1	3		2	21
2. Chronic Bronchitis	4	9		3	10		2	11											1					1	1	3	7		3	4	2		2	1			1		2	1	13
3. Broncho-pneumonia	7	7		7	7		6	8		2	2											1	3	2	2	2			2	3		2	2	1			2	1	1		11
4. Pneumonia	63	49		62	47	3	10	68	1	11	6	1			1			1	1	2	3	6	7	11	21	22	15	1	11	22	7	11	13	12	[illegible]	4	8	3	3	12	112
5. Pleurisy	5	11		9	7		4	12		1			1						3	2				1	3	1	2	2	2	2	4	1		1	1			3		2	16
6. Congestion of the Lungs	6	2		2	6		2	5	1	2														1	2		3		2	1	2		1	1			1				8
7. Asthma and Emphysema	1	2		2	1			3														1		1	1						1									2	3
8. Other Diseases of Respiratory System																																									
Total	91	93		100	84	3	64	117	6	25	9	1	1		4			1	5	4	4	8	10	19	32	31	30	3	27	33	17	15	23	16	4	4	13	10	6	19	187
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	2	2		2	2		3	1									1	1		1		1										1	1	1	1						4
2. Other Diseases of Stomach (cancer excepted)	6	4		4	4	2	1	8	1									1						4	2	1	2		3	1		1	1	1			1		1	1	10
3. Infantile Diarrhœa and Cholera Infantum	13	13		26			26			21	5																					1	1	2	3	12	5	1		1	26
4. Diarrhœa and Enteritis (not infantile)	4	6		6	4		5	3	2			1	1			1						1		2	1	2	1		1	3			1		1	2	2				10
5. Dysentery	1				1			1																1													1				1
6. Hernia and Intestinal obstructions	1	3		1	3			1																1	1	2				1				2					1		4
7. Other Diseases of the Intestines	1	3			4			4														1	1		1	1			1				1	1						1	1
8. Diseases of the Liver	7	1		4	4		4	4					1									1		2	3	1			1			1	2			1	1	2			8
9. Peritonitis (not Puerperal)	9	9		13	5		8	10						1		1	1	3	2	1	1	2	2	2	1	1				1	2	1	2	2	2		1	1	3		18
10. Iliac Abscess and Appendicitis	3	3		4	1	1	3	3										1	1		2		1	1					1					1		1	2		1		6
Total	47	41		60	28	3	50	38	3	21	5	1	2	1		2	2	6	3	2	3	6	4	13	9	8	3		7	9	2	5	9	10	7	16	13	4	6	3	91
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	3	2		3	2		2	3												1		1	2	1												1	1	1			5
2. Bright's Disease	21	16		13	23	1	4	28	5		1						1	1		1	2	5	1	5	7	9	4		2	4	3	3	7	5	1	2	4	2	2	2	37
3. Other Diseases of Kidneys and Adnexa	1	1		1	1			2																	1	1					1	1									2
4. Vesical Calculi																																									
5. Diseases of the Bladder	6			3	3			6													1				2	1	2					2	1	2						1	6
6. Diseases of the Male Genital Organs	2			1	1			2																	1	1							2					1			2
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the female Genital Organs		2		2				2												1	1														1			1			2
Total	33	21		23	30	1	6	43	5		1						1	1		3	4	6	3	6	11	12	6		2	4	4	6	11	7	2	3	5	5	2	3	54
PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		3		3				3									1			1											2			1							3

Cause												
2. Puerperal Albuminuria and Convulsions	....	3	....	3	...	...	...	3	....	...	1 2 1 1	3
3. Other accidents of Pregnancy, sudden death	....	3	....	2	1	....	...	3	....	...	1 1 1 1 1 1 1	3
4. Puerperal Disease of the Breast	....	....	....	....	....	....	....	...	....	....		...
Total	..	9	....	8	1	....	....	9	....	...	2 2 2 3 3 2 2 1 1	9
IX. THE SKIN.												
1. Erysipelas	[illegible]	4	..	5	1	1	5	1	1	3	1 1 1 2 2 1 4 1 1	10
2. Other Dis. of Skin and Adnexa (cancer except.)	1	...	...	....	1	..	....	1	...	...	1 1	1
Total	7	4	...	5	5	1	5	5	1	3	1 1 1 3 2 1 1 1 1 1	11
X. LOCOMOTOR SYSTEM.												
1. Pott's Disease												......
2. Diseases of Bones and Joints	.	2	..	1	...	1	1	1			1 1 1 1	2
3. Amputation (for unspecified Dis.)												
Total	..	..		1	...	1	1	1	....	...	1 1 1 1	2
XI. MALFORMATIONS, ETC.												
1. Still-births	56	10	9	105			105	...	....	105	5 8 10 10 12 10 6 6 6 9 13 10	105
2. Congen. Debility and Malformations	56	11	1	104			104	..		104	6 12 11 9 13 10 9 6 6 9 6 7	104
3. Other Diseases of Infancy	...	3	....	3		..	3		...	1	2 1 2	3
4. Senile Decay	64	51	..	25	87		10	102	3	...	16 69 21 22 12 8 10 5 6 6 8 5 8 4	115
Total	176	138	13	235	87		222	102	3	210	2 16 69 33 42 33 27 35 27 21 18 20 23 27 21	327
XII. SUICIDE.												
1. Poison												
2. Strangulation	1	1	..	2			..	2		....	1 1 1 1	2
3. Gas Poisoning												
4. Drowning	.	1	..	1	..	..	..	1	..		1 1	1
5. Firearms												
6. Not stated	1	1		1	1	.	1	1	..		1 1 1 1	2
Total	2	3	.	4	1		1	4	.	...	1 2 1 1 1 1 1 2	5
XIII. ACCIDENTS.												
1. Fractures and Dislocations	3	2	.	4	1	..	2	3		...	1 1 1 1 1 1 1 2 1	5
2. Gunshot												
3. Lightning	2	..	..	2	.	....	1	1	..		1 1	2
4. Drowning	5	...	....	3	....	..	5	..			2 1	3
5. Electric Cars	1	2	..	2	1	....	2	1		....	1 1 1 1 1 1	3
6. Bicycles												
7. Railways	8	..	...	4	4	....	6	2			4 1 1 1 1 1 1 2 1 1 1 1	8
8. Burns and Scalds	2	3	.	3	2	....	3	2	.	.	3 1 1 1 1 1 1 1 1	5
9. Homicide	1	...	...	...	1	....	..	1			1 1	1
10. Other Accidents	22	5	...	12	10	5	10	13	4	...	1 3 3 4 1 3 2 2 3 3 2 1 1 2 2 3 1 3 2 1 5 3 3	27
Total	42	12	...	30	19	5	27	23	4	....	1 1 1 1 6 7 6 2 4 4 4 5 6 4 2 2 2 3 4 1 3 10 7 4 6 1 5	54
XIV. ILL DEFINED CAUSES.												
1. Dropsy	3	1	...	2	2	...	1	3	..	...	3 1 2 1 1	4
2. Tumors	7	8	....	8	7	...	2	11	2	...	1 1 1 1 1 3 3 1 3 3 2 1 2 1 1 1 1	15
3. Other Ill Defined Causes	4	1	..	3	4	1	3	4	1	....	1 1 3 3 2 2 1 1 1 1	8
4. Heart Failure	11	8	..	13	4	2	5	15	1	...	1 1 1 1 1 2 8 4 1 1 1 2 2 4 1 2 2	19
Total	25	21	..	26	17	3	11	31	4	..	1 1 1 1 2 3 5 3 11 13 3 2 1 4 6 4 3 3 4 6 6 1 3 2	46
Total from all causes	711	617	13	759	511	31	580	718	43	278	28 9 13 5 24 9 30 63 45 40 63 59 52 126 152 188 143 14 133 165 126 118 124 100 92 94 100 91 86 112	1,341

CAUSES OF DEATHS BY COUNTIES IN 1904—YORK.—(Including municipalities of all classes.)

General Diseases.	Sex. Male.	Sex. Female	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated	Social Conditions. Single.	Social Conditions. Married.	Social Conditions. Not stated.	Ages. Under 5: 0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given.	Months. January	February	March.	April.	May.	June	July.	August	September	October	November.	December	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	49	32		56	22	3	41	35	5	1					4	6	7	14	11	5	5	1	7	2	6	5	1		5	3	5	7	5	11	1	10	11	6	8	9	81
2. Smallpox	1	1		2			1	1		1									1											1					1						2
3. Measles	4	3		7			7			1	3	2						1													1	2	1	1			1			1	7
4. Scarlet Fever	11	3		14			14				1	3	1		4	2													1	1	3		2		1	1		1	1	3	14
5. Whooping Cough	3	5		8			8			5	2	1																		1						2	3	1		1	8
6. Diphtheria and Croup	81	79		144	16		151	9		8	11	20	28	15	41	17	6	3	5		3	1	1	1					27	14	22	8	11	9	3	6	8	10	18	22	160
7. Influenza	15	17		15	17		7	25		4	4								1					2	3	13	5		15	7	2	4	4								32
8. Other Epidemic Diseases																																									
Total	164	140		246	55	3	229	70	5	20	21	26	32	5	19	25	13	18	21	5	8	5	8	5	9	18	6		48	27	33	21	23	23	6	19	23	18	27	30	304
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	17	33		33	17		13	37				1			2	1	4	4	7	7	6	5	2	3	1	4	2	1	3	2	11	5	5	5	2	4	2	4	5	2	50
2. Malarial Fever	1	1		1	1		1	1											1				1														1	1			2
3. Tuberculosis and Scrofula	210	229		334	102	3	213	207	19		12	2	1	1	7	7	42	52	66	52	48	40	25	47	28	9			38	40	39	48	46	38	29	28	31	27	39	36	439
4. Syphilis		2		1	1		1		1			1													1					1				1							2
5. Cancer	88	140		102	118	8	31	192	5			1			1			3	1	6	5	24	20	41	58	51	9	5	20	14	16	21	15	20	21	15	26	21	18	21	228
6. Rheumatism and Gout	14	6		14	6		6	13	1						1		2	1			1		3	2	4	5	1		5	2	2	1	3			1	1		1	4	20
7. Diabetes	19	15		22	11	1	11	22	1						1	2	2	2	1	1	1	3	1	8	8	3	1		9	3	3	3	1			5	1		4	5	34
8. Other General Diseases	21	32		27	25	4	12	42	2							1	1	2	3	3	1	5	3	9	13	13	1	1	7	3	4	17	3	5	4	2	3	5	1	2	56
9. Alcoholism, Acute and Chronic	5	1		2	4		3	3												1		2		2	1									2	1	2				1	6
Total	378	459		536	285	16	291	517	29		12	5	1	1	12	11	51	64	79	70	62	79	55	115	114	85	14	7	82	65	75	95	73	71	57	57	65	58	68	71	837
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	4	4		7	1		2	5	1						1		1	1			1		1	1	2				1	1		1	1			1	1	2			8
2. Simple Meningitis	52	34		81	5		74	11	1	41	10		2	1	3	4	2	3		1	3	2	1	7	1				7	7	8	8	10	7	7	9	6	6	1	7	86
3. Epidemic Cerebro-spinal Meningitis	7	7		13	1		11	3		3	4	1				3						2			1				1	1	1	1	1	1	5	1	1		1		14
4. Congestion and Hemorrhage of the Brain	101	79		68	113	2	23	153	7	1	1							1	1	1	3	10	11	28	40	51	31	4	13	20	11	24	19	14	18	7	12	8	21	16	183
5. Softening of the Brain	11	16		12	15		5	22				1					1	1			1			3	6	12	2		4	4	1	1	1	2	2	2	3	1	2	1	27
6. Paralysis without specified cause	77	56		58	70	5	19	111	3					1	2		2	2	1	3	4	6	11	16	31	31	20	3	25	11	12	10	7	8	5	11	9	10	12	13	133
7. Insanity	10	8		12	6		7	10	1								1	1	2	1	2	1	2	2	3				2	3	2	5	1		1		1	3			18
8. Epilepsy	5	11		10	6		9	7									4			4	2				5	1			2		1	4		1	3	1	1	1		2	16
9. Convulsions (not puerperal)	62	49		110	1		107	4		85	11	1	1		1				1	2				1	2				13	6	19	8	6	10	9	12	8	11	4	5	111
10. Other Nervous Diseases	15	8		14	9		10	12	1							1			3		2	4	3	6	4				3		1	5	1	2	2	2	3	2	1	1	23
Total	347	272		385	227	7	267	338	14	130	29	8	3	5	7	8	11	9	8	15	18	25	29	64	95	95	53	7	71	53	56	67	50	45	52	46	45	44	45	45	619

IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis	3	5		4	4		6	2					1			1	3				1			1		1			3	1		1		1	1					1	8
2. Endocarditis	6	12		15	3		7	11						1	1			3			3	1	3	1	2	3			2	2	1	1		1	1			5	1	4	18
3. Organic Heart Diseases	164	181		153	183	9	79	249	17			1			6	5	11	13	10	9	11	22	16	59	81	69	25	7	32	25	40	23	33	26	11	27	33	28	33	34	345
4. Angina Pectoris	13	8		7	14		1	18	2									1				2	1	5	2	9	1		2	2	2	3		1		1	3	2	2	3	21
5. Arteries, Atheroma, Aneurism, etc.	19	14		13	17	3	2	27	4											2			3	4	6	9	9		5	4	3		5	4		4	2		2	4	33
6. Other Diseases of Circulatory System																																									
Total	205	220		192	221	12	95	307	23			1	1	1	7	6	14	17	10	11	15	25	23	70	91	91	35	7	44	34	46	28	38	33	13	32	38	35	38	46	425
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	56	62		79	35	2	70	44	4	41	15	5	3	1	2			1		1				6	12	13	18		22	6	16	5	13	11	9	3	12	4	6	11	118
2. Chronic Bronchitis	10	13		11	11	1	4	18	1						1										8	9	4	1	7	2	2	1	1	1	2	2	1	2	2		23
3. Broncho pneumonia	67	47		89	24	1	83	31		31	23	8	1	1	3	1	2	1	1	2	1		2	7	8	10	6		18	5	17	8	16	10	7	6	3	7	8	9	114
4. Pneumonia	125	122		148	93	6	95	144	8	22	15	5	1	2	2	3	10	13	7	7	9	12	11	13	32	39	33	11	61	38	31	25	20	12	7	5	4	7	15	22	247
5. Pleurisy	15	10		12	18		7	16	2								1	1	5		1		2	4	6	3	2		5	4	4	5	1	1			2	2		1	25
6. Congestion of the Lungs	8	12		14	6		9	11		3	1		1		1				2			1	1	1	1	3	5		4	1	1	1	1	2	1		3	1	1	1	20
7. Asthma and Emphysema	9	5		6	7	1	2	12												1			1	3	5	2	2		4			2		1		2	1	2	1	1	14
8. Other Diseases of the Respiratory System	1			1			1										1																		1						1
Total	291	271		360	191	11	271	276	15	100	54	18	9	4	9	1	14	16	15	11	11	13	17	34	72	79	70	12	121	56	71	50	52	38	27	18	26	25	33	45	562
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	3			1	2		1	2												1	1					1										1	1	1			3
2. Other Diseases of Stomach (cancer excepted)	10	15		8	16	1	4	20	1					1					1	1	2		1	5	7	6	1		1	3	1	4	2		4	2		1	2	2	25
3. Infantile Diarrhœa and Cholera Infantum	117	99		215	1		216			197	19																		7	8	5	6	9	8	33	76	31	16	10	4	216
4. Diarrhœa and Enteritis (not infantile)	8	10		8	10		9	9				1	1			1		3			1			2	3	1	5						1	2	1	7	2	2	3		18
5. Dysentery	3	3		5	1		2	4											1	1	1				2	1								1	1	2	2				6
6. Hernia and Intestinal obstructions	10	12		10	11	1	4	17	1							1		2	1	2	1	1	2	1	1	4	3		5	2		2	1	2	2	2	3	1	1	1	22
7. Other Diseases of the Intestines	10	5		8	7		6	8	1									1	3	1	1	2		3	1	2	1		1	5	1	1	2			1		3		1	15
8. Diseases of the Liver	24	18		16	26		5	37				1						1	2		1	2	2	9	11	11	2		3	5	3	1	1	1	6	1	4	4	4	6	42
9. Peritonitis (not puerperal)	30	46		51	23	2	34	38	4	1		1			1	1	11	9	9	6	4	10	4	7	5	1			12	10	5	4	12	6	7	5	5	6	2	2	76
10. Iliac Abscess and Appendicitis	21	18		30	9	3	23	18	1						2	7	3	2	5	4	1	5	4	4	5	1		2	1	2	7	7	5	3	2	2	6	3	3	1	42
Total	239	226		352	106	7	304	153	8	198	19	3	1	1	3	13	14	18	22	16	13	20	10	31	38	31	12	2	30	35	25	25	36	23	56	99	57	37	25	17	465
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	39	25		24	38	2	11	51	2	1	1		1				1	2	1	4	2	3	4	10	19	11	4		12	10	9	2	2	4	5	5	4	6	2	3	61
2. Bright's Disease	60	48		62	43	3	33	69	6						1	6		4	10	6	11	6	4	16	22	16	1	2	14	11	9	14	11	7	6	6	6	4	11	9	108
3. Other Diseases of Kidneys and Adnexa	6	4		5	5		2	7	1												1	1			5	1	1	1	3				3		1			2	1		10
4. Vesical Calculi	1				1			1																		1									1						1
5. Diseases of the Bladder	13	1		5	9		3	11														1		2	6	4	1		2	2	2	1	1	1	1	1		1	1	1	14
6. Diseases of the Male Genital Organs	3				3			3																		2	1				1									2	3
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		4		1	3			3	1													1	1	1	1				1	1	1								1		4
10. Other Diseases of Female Genital Organs		6		5	1		1	5									1	2		2					1					1				2				1		2	6
Total	122	88		102	103	5	50	150	10	1	1		1		1	6	2	8	11	12	14	12	9	29	54	35	11	3	32	25	22	17	17	14	14	12	10	14	16	17	210
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		6		6				6											1	3	2								1		1	1			1		1		1		6
2. Puerperal Albuminuria and Convulsions		15		10	4	1		15										3	6	1	3	2								1	4	1	2	1	1	1	1	1	1	1	15
3. Other accidents of Preg. and sudden death		15		5	10			15										2	3	2	3	5							3	2			1	1		1	2	1	2	2	15
4. Puerperal Diseases of the Breast																																									
Total		36		21	14	1		36										5	10	6	8	7							4	3	5	2	3	2	2	2	4	2	4	3	36

YORK.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	11	6		9	8		5	12		2						1				1	1	2	1	3	3	1	2		4	4	1	1	1						2	1	17
2. Skin and Adnexa (cancer excepted)	5	1		3	3		1	5													1	1	1	2		1			1		1	1	1		1		1				6
Total	16	7		12	11		6	17		2						1				1	2	3	2	5	3	2	2		5	4	2	5	2		1		1		2	1	23
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease	....	....		....																																					
2. Diseases of the Bones and Joints	....	....		....																																					
3. Amputation (for unspecified diseases)	....	....		....																																					....
Total	....	....		....																																					.....
XI. MALFORMATIONS, ETC.																																									
1. Still-births	182	128		310			310			310																			22	30	31	21	25	26	33	31	27	19	21	18	310
2. Congen. Debility and Malformations	273	219		492			492			489	3																		33	35	50	50	45	26	56	49	45	34	34	35	492
3. Other Diseases of Infancy	4	10		14			14			13	1																		3	2		2			2	2	2		1		14
4. Senile Decay	146	175		76	235	10	36	275	10																26	101	183	11	40	35	32	16	33	22	20	31	31	15	20	26	321
Total	605	532		892	235	10	852	275	10	812	4														26	101	183	11	98	102	116	92	103	74	111	113	105	78	66	79	1,137
XII. SUICIDE.																																									
1. Poison		2		2			2										1				1																	1	1		2
2. Strangulation	1				1			1																	1				1												1
3. Gas Poisoning																																									.....
4. Drowning																																									.....
5. Firearms	3			3				3														1		1	1						1		1					1			3
Total	4	2		5	1		2	4									1				1	1		1	2				1		1		1					2	1		6
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	21	3		13	11		10	13	1						1	1	2		2	1	2	1	1	3	1	2	1			1	1	1	4	2	1	2	2	5	1	1	24
2. Gunshot	3			2	1		1	2								1									2											2		1			3
3. Asphyxiation	10	2		7	5		3	8	1								2			2		1	1		5	1						2				2	2	3		3	12
4. Drowning	17	2		13	6		13	5	1						1	2	4	6	2					1	2			1			1	1	4	5	3	1				1	19
5. Electric Cars	5	6		4	7		6	5								4				1				2	3	1			1		1	1		1	1	1	3	1		1	11
6. Tetanus	2			2			1		1							1									1											1			1		2
7. Railways	18	2		8	11	1	11	9							1	1	3	4	2		3		1	3		1	1		1	1	1			1	1	8	1		2	1	20
8. Burns and Scalds	8	14		17	4	1	15	6	1	2	2	3	2	2	1	1				2	2	1	1	2		1			3	1	1	2			2	2	2	3	2	1	22
9. Homicide	2	1		2		1	2		1	2																		1						1		1	1				3
10. Other Accidents	36	11		26	18	3	20	23	4	2	1	1	2		1	1		3	6	1	5	7	2	4	3	3	2	3	8	4	3	6		2	4	1	6	1	5	4	47
11. Poisoning	9	3		6	5	1	3	9									2		1	2	3	1			3						3	1	2	2		2	1		1		12
Total	131	44		100	68	7	85	80	10	6	3	4	4	2	5	12	13	13	13	12	15	14	6	15	20	9	4	5	13	7	14	14	10	14	15	29	18	14	15	12	175
XIV. ILL-DEFINED CAUSES																																									
1. Dropsy	3	8		5	6		1	10																1		1	3		2				2	3	2					2	11
2. Tumors	12	27		26	11	2	14	23	2		1					2	2	4	2		5	2	2	11	4	2	1	1	6	3	2	5	2	1	3	5	5	3	1	3	39
3. Other Ill-defined Causes	9	12		13	1	4	10	10	1						1	1		4	2	1	1	2	1	1	4			3	2	4			1	2	1	2	4	2	2	1	21
4. Heart Failure	32	29		36	25		19	35	7							3	2	6	2	2	7	6	9	13	10	1			9	2	7	8	5	4	5	3	2	5	6	5	61
Total	56	76		80	46	6	44	78	10		1				1	6	4	14	6	3	13	10	12	29	18	7	4	4	19	9	9	13	10	10	11	10	11	10	9	11	132
Total from all causes	2,558	2,373	..	3,283	1,563	85	2,496	2,301	134	1,269	144	65	52	29	94	92	137	182	195	162	180	214	171	398	542	553	394	58	568	420	475	429	418	347	365	437	403	337	349	383	4,931

CAUSES OF DEATHS BY CITIES IN 1904.—TORONTO.

General Diseases.	Sex.			Nativity.			Social Con.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0.-1	1.-	2.-	3.-	4.-	5-9.	10-14	15-19	20-24	25-29	30-34.	35-39.	40-44.	45-49	50-59	60-69.	70-79.	80 and over.	Not given.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	36	20	..	36	17	3	29	23	1	...		.	.	.	1	4	5	12	13	2	4	4	5	2	2	2			4	2	3	6	3	6	1	7	7	4	7	6	56
2. Smallpox	1	1	...	2	...		1	1	..	1	.		.	.	.				1	.		.	.	.	.		.		.	1	.	.		..	1	..	.	.	..	.	2
3. Measles	4	3	..	7	......	...	7		...	1	3	2	.	..	.	.		1			.	.	.	.	.	.	.		.		1	2	1	1	.	.	1	.	..	1	7
4. Scarlet Fever	9	2	....	11	...	...	11	...	..	....	1	3	2	.	1	1		.	.	.	..	.						.	.	1	3		2	.	1	1		1	1	1	11
5. Whooping Cough	3	5	...	8	....	....	8	...	...	5	2	1	.			.	.	..	.	.	..	.	.		.	.	...	.	.	1	.		.	.	.	2	3	1	.	1	8
6. Diphtheria and Croup	68	59	.	112	15		120	7	....	8	10	15	24	12	32	10	3	3	5	.	3	1	1	.	.		.	.	22	10	19	7	10	10	1	5	5	8	13	17	127
7. Influenza	10	12	....	7	15	..	4	18		3	1		.	.		.	..	.	.	.	.	..		2	2	11		.	10	5	..	4	3	.		.		..	.		22
8. Other Epidemic Diseases	...	...	...	..	....	..	.		...	..			.			.			.			.		.	.	.	.	.	.	..			.			.	.	.			.....
Total	131	102	....	183	47	3	180	49	4	18	20	21	26	12	37	15	8	16	19	2	7	5	6	4	4	13	.		36	20	25	19	19	17	4	15	16	14	21	26	233
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	11	28	..	27	12		11	28		..				.	2	1	4	3	7	6	5	1	1	2	1	2	.	1	3	2	6	4	4	5	1	1	.	4	5	1	39
2. Malarial Fever	1	1	..	1	1	..	1	1		...	.	..				.			1			.	1				.		.	.	.		.				1	1	.		2
3. Tuberculosis and Scrofula	169	169	..	250	85	3	173	150	15	...	10	2			5	5	33	39	57	8	36	29	17	8	21	5	.		32	29	29	39	37	31	23	24	22	20	28	24	338
4. Syphilis	.	2	..	1	1	. .	1	.	1	..		1	.	.			.		.	.		.	.	.	1	.	.		.	1	.	.	.	1	.	.		.	..	.	2
5. Cancer	71	116	..	78	103	6	25	157	5	.	1				1	.		2	1	6	2	21	15	41	19	40	4	4	15	12	11	20	13	15	13	14	18	20	14	19	187
6. Rheumatism and Gout	10	4	..	11	3	....	1	10	..	. .					1		1	.	.	.	1	.	3	1	3	4	.		2	1	2	1	2	.	.	1	.	.	1	4	14
7. Diabetes	13	9	..	13	8	1	7	14	1	.						2	1	2	.	.	1	3	1	4	6	2			7	.	2	2	1	.	.	3	1	.	3	3	22
8. Other General Diseases	16	27	....	20	20	3	9	33	1	...	.	.	.	.		1	1	2	2	3	1	5	2	4	11	9	1	1	5	3	4	12	2	3	2	2	3	4	1	2	43
9. Alcoholism, Acute and Chronic	3	1	..	2	2	....	2	2	...	...	.				.		.	.		1	..	1	.	2		.		.				.	.	.	1	1	1	.	.	.	1	4
Total	291	357	....	403	235	13	233	395	23	....	11	3	.		9	9	10	48	68	54	46	63	40	92	35	62	5	6	64	18	57	78	59	56	40	19	45	49	52	54	651
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	4	4	.	7	1	.	2	5	1	...	.		.	.	1	.	1	1	.	.	1	.	1	1	2	..	.	.	1	1	.	1	1	.	.	1	1	2		.	8
2. Simple Meningitis	47	30	...	73	4	....	67	9	1	37	9	2	2	4	3	2	2	3		1	3	2	1	5	1		.	.	7	7	6	8	7	7	7	7	6	4	4	7	77
3. Epidemic Cerebro-spinal Meningitis	6	5		10	1	..	8	3	.	2	3	1	.	.		2				.	.	2	.		1		.	.	1			1	1	1	5	1			1	.	11
4. Congestion and Hemorrhage of the Brain	73	62	..	44	91	..	11	118	6	1	1	.		.					1		3	6	6	22	31	40	21	3	10	15	7	22	15	10	10	3	10	5	16	11	135
5. Softening of the Brain	4	11		8	7		3	12	....	.		1	.					1	.		1	.	.	2	1	4	2		3	2	1	1	2	.	2		2	1	1	1	15
6. Paralysis without specified cause	63	46	...	42	63	4	13	94	2		.			1	2		2	2		1	4	5	9	11	26	22	18	3	20	7	9	9	6	7	5	10	9	8	8	11	109
7. Insanity	4	3	..	3	4		1	5	1					.	.			.	.	1	.	1	1		2			..	2	.	1	.	.		1			3	.		7
8. Epilepsy	1	5	..	4	2	.	3	3	.		.	.		.		.	2			3		.	.		1	.	.		2		.	2	.	1		1	.	.		.	6
9. Convulsions (not puerperal)	52	37	...	89	..	...	88	1	....	70	12	3	1		.	.	.	.	1	1		.		1	.		.	.	10	5	14	6	6	6	5	12	8	8	4	5	89
10. Other Nervous Diseases	14	5	.	11	8		7	11	1	...		.	.			.	.		2	.	2	1	3	1	1				3		1	4	1	2	2	1	2	2	1	.	19
Total	268	208	..	291	181	4	203	261	12	110	25	7	3	5	6	4	7	7	6	7	14	20	21	19	72	66	41	6	59	37	39	54	39	34	37	36	38	33	35	35	476

TORONTO.—*Continued.*

Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis	3	5		4	4		6	2					1			1	3				1			1		1			3	1		1		1	1					1	8
2. Endocarditis	5	11		14	2		7	9						1	1			3			3	1	3	1	1	2			2	2	1	1		1	1			4	1	3	16
3. Organic Heart Disease	133	143		117	154	5	60	202	14			1			5	3	7	12	10	8	9	18	13	50	68	53	14	5	24	19	33	20	30	23	9	23	25	19	24	27	276
4. Angina Pectoris	11	8		6	13		1	16	2									1			2		1	5	2	8			2	1	2	3		1		1	2	2	2	3	19
5. Diseases of Arteries, Atheroma, Aneurism, etc.	16	12		10	15	3	2	23	3										2				3	3	6	7	7		4	4	2		4	4		4	1		1	4	28
6. Other Diseases of the Circulatory System																																									
Total	168	179		151	188	8	76	252	19			1	1	1	6	4	10	16	12	8	15	19	20	60	77	71	21	5	35	27	38	25	34	30	11	28	28	25	28	38	347
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	42	52		62	30	2	55	35	4	33	12	3	2	1	1			1		1				6	9	8	17		17	4	10	5	12	5	8	3	12	4	5	9	94
2. Chronic Bronchitis	6	7		5	7	1	2	11							1										3	6	2	1	5	1	1		1	1	2	1			1		13
3. Broncho-pneumonia	56	34		69	20	1	66	24		25	18	6	3	1	3		2	1	1	2	1		2	5	7	9	4		13	5	13	5	13	9	4	4	3	6	7	8	90
4. Pneumonia	101	103		117	82	5	82	115	7	21	14	5	1	2	1	2	9	10	5	7	9	11	11	13	26	25	31	11	50	28	23	21	20	11	5	5	3	7	14	17	204
5. Pleurisy	13	4		8	9		5	10	2								1		3		1		2	2	6	2			2	3	3	3	1	1			1	2		1	17
6. Congestion of the Lungs, (inc. pul. apoplexy)	5	8		8	5		6	7		1	1		1						2				1	1	1	2	3		4	1	1	4		2						1	13
7. Asthma and Emphysema	5	5		3	6	1	1	9												1			1	2	4	2			4			2		1				2		1	10
8. Other Diseases of the Respiratory System	1			1			1										1																		1						1
Total	229	213		273	159	10	218	211	13	80	45	14	7	4	6	2	13	12	11	11	11	11	7	29	56	54	57	12	95	42	51	40	47	30	20	13	19	21	27	37	442
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	2			1	1			2												1	1															1		1			2
2. Other Diseases of Stomach (cancer excepted)	7	13		7	12	1	2	18												1	2		1	5	5	5	1		1	1	4	4	2		2	2			2	2	20
3. Infantile Diarrhœa and Cholera Infantum	98	94		191	1		192			176	16																		4	7	5	5	7	8	32	65	31	16	10	2	192
4. Diarrhœa and Enteritis (not infantile)	5	7		4	8		5	7				1				1		2			1			2	2		3							1	1	6	1	2	1		12
5. Dysentery	1	1		2			1	1											1	1															1		1				2
6. Hernia and Intestinal obstructions	8	10		9	8	1	4	14								1		2		2	1	1	2	1	4	2	2		4	2		2	1	1	2	2	2	1	1		18
7. Other Diseases of the Intestines	6	5		7	4		4	7										1	2		1	2		3	1	1			1	4	1		2			1		2			11
8. Diseases of the Liver	18	16		10	24		5	29				1						1	2		1	1	2	8	8	8	2		1	4	2	1	3	1	6	1	3	3	3	6	34
9. Peritonitis (not puerperal)	26	36		40	20	2	29	30	3	1		1			1	4	7	8	9	4	3	8	3	6	5	2			10	6	4	3	11	6	6	5	4	5		2	62
10. Iliac Abscess and Appendicitis	23	15		27	8	3	21	16	1							7	3	2	5	4	1	4	1	4	4	1		2	1	2	7	6	3	3	2	1	6	3	3	1	38
Total	194	197		298	86	7	263	124	4	177	16	3			1	13	10	16	19	13	11	16	9	29	29	19	8	2	22	26	23	21	29	20	52	84	48	33	20	13	391
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	35	21		19	35	2	9	45	2	1	1						1	2	1	2	2	3	4	9	18	8	4		10	9	8	2	2	4	4	4	4	4	2	3	56
2. Bright's Disease	48	39		47	37	3	23	58	6						1	2		4	9	4	10	5	4	15	17	12	2	2	13	8	6	9	10	6	6	5	3	4	10	7	87
3. Other Diseases of the Kidneys and Adnexa	4	3		2	5		1	5	1													1			3	1	1	1	2				2		1			1	1		7
4. Vesical Calculi	1				1			1																		1									1						1
5. Diseases of the Bladder	11	1		5	7		3	9														1		2	6	2	1			2	2	1	1	1	1	1		1	1	1	12
6. Diseases of the Male Genital Organs	3				3			3																		2	1				1									2	3
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and Ovarian Tumors		3		1	2			2	1													1		1	1				1	1									1		3
10. Other Diseases of the Female Genital Organs		4		4			1	3									1	2							1					1				1						2	4
Total	102	71		78	90	5	37	126	10	1	1				1	2	2	8	10	6	12	11	8	27	46	26	9	3	26	21	17	12	15	12	13	10	7	10	15	15	173

VIII. PUERPERAL DISEASES.																																									
1 Puerperal Septicaemia		2		2				2												1	1								1			1									2
2 Puerperal Albuminuria and Convulsions		12		7	4	1		12										1	6	1	3	1								1	3	1	1		1	1	1	1	1	1	12
3 Other Accidents of Pregnancy, sudden death		11		4	7			11										2	3	2	2	2							3	1			1	1		1		1	2	1	11
4 Puerperal Disease of the Breast																																									
Total		25		13	11	1		25										3	9	4	6	3							4	2	3	2	2	1	1	2	1	2	3	2	25
IX. THE SKIN.																																									
1 Erysipelas	7	3		5	5		2	8		1										1	1	1	1	3	2				3	4		2							1		10
2 Skin and Adnexa (cancer excepted)	4	1		2	3			5													1		1	2		1			1		1		1		1		1				5
Total	11	4		7	8		2	13		1										1	2	1	2	5	2	1			4	4	1	2	1		1		1		1		15
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease		1		1			1									1															1										1
2 Diseases of Bones and Joints	2	1			3		2	1								1					1			1							1			1			1				3
3 Amputation for unspecified Diseases																																									
Total	2	2		1	3		3	1								2					1			1							2			1			1				4
XI. MALFORMATIONS, ETC																																									
1. Still-Births	152	106		258			258			258																			22	25	29	20	22	23	25	27	18	15	18	14	258
2. Congenital Debility and Malformations	228	184		412			412			411	1																		29	26	45	36	40	26	48	41	37	27	27	30	412
3. Other Diseases of Infancy	2	8		7	3		10			1	5	2	2																3	2		1			1		2		1		10
4 Senile Decay	85	117		32	163	7	22	172	8																19	67	105	11	23	25	19	10	21	17	11	18	20	11	13	14	202
Total	467	415		709	166	7	702	172	8	770	6	2	2												19	67	105	11	77	79	93	67	83	66	84	86	77	53	59	58	882
XII. SUICIDE.																																									
1 Poison		2		2			2										1				1																	1	1		2
2 Strangulation	1				1			1																	1					1											1
3 Gas Poisoning																																									
4 Drowning																																									
5 Firearms	2			2				2																1	1								1					1			2
Total	3	2		4	1		2	3									1				1			1	2					1			1					2	1		5
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	17	3		9	11		8	11	1						1		2		2	4	2	3	1	3		1	1			1	1		2	1	1	2	2	5	4	1	20
2 Gunshot																																									
3. Asphyxiation	10	2		7	5		3	8	1								2			2		1	1		5	1						2				2	2	3		3	12
4. Drowning	17	2		13	6		13	5	1						1	2	4	6	2					1	2			1			1	1	4	5	3	4				1	19
5. Electric Cars	5	6		4	7		6	5							4					1				2	3	1			1		1	1		1	1	1	3	1		1	11
6. Tetanus	2			2			1		1							1									1											1			1		2
7 Railways	12	2		6	8		7	7							1	1	2	1	2		3			2		1	1		1	1	1			1	2	5	1		2		14
8 Burns and Scalds	7	12		14	4	1	12	6	1	2		3	2	2	1	1				1	2	1	1	2		1			3	1	2	1			2	2	2	3	2	1	19
9 Homicide	2	1		2		1	2		1	2																		1						1		1	1				3
10 Other Accidents	26	10		16	17	3	15	18	3				2		1	1		3	4	1	5	5	1	3	3	2	2	3	6	2	2	4		2	4	1	5	1	5	4	36
11 Poisoning	9	3		6	5	1	3	9									2		1	2	3	1			3						3	1	2	2		2	1		1		12
Total	107	41		79	63	6	70	69	9	4		3	4	2	9	6	12	10	11	11	15	11	4	13	17	7	4	5	11	5	11	10	8	13	13	21	17	13	15	11	148
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	1	5		2	4		1	5																2		2	2		1				2	1						2	6
2 Tumors	8	22		18	10	2	11	17	2		1					2	2	2	1		5	1	2	9	3		1	1	5	1	1	5	2	1	1	4	4	3	1	2	30
3 Other Ill defined Causes	5	9		9	3	2	7	6	1							1		1	2	1	1	1	1	1				2	2	3			1			2	4		1	1	14
4 Heart Failure	24	20		26	17	1	10	27	7					1		3		2	1	2	3	6	7	10	8	1			8	2	5	4	3	4	4	2	1	1	5	5	44
Total	38	56		55	34	5	29	55	10		1			1		6	2	8	4	3	9	8	10	22	11	3	3	3	16	6	6	9	8	6	5	8	9	4	7	10	94
Total from all causes	2,014	1,872	.	2,545	1,272	69	2,018	1,756	112	1,161	125	54	43	25	75	63	105	144	169	120	150	168	127	332	430	389	253	53	449	318	367	339	345	286	281	355	307	259	284	199	3,886

CAUSES OF DEATHS BY CITIES IN 1904—HAMILTON.

General Diseases.	Sex			Nativity			Soc'l con.			Ages. Under 5																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over.	Not given.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	9			5	4		6	3		1								2	2	2			1					1		1		2	1				3	1		1	9
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	3		3	2		5				1		3		1															2		2						1			5
5. Whooping Cough																																									
6. Diphtheria and Croup	8	6		11	3		13	1				3	2	1	6		1					1							1	1		1	2	3	1	1		1	1	2	14
7. Influenza	2	8		6	4		2	7	1	1					1			1						1	2	2	1	1	2	4	1									3	10
8. Other Epidemic Diseases																																									
Total	21	17		25	13		26	11	1	2	1	3	5	1	8		1	3	2	2		1	1	1	2	2	1	2	3	8	1	5	3	3	1	1	3	3	1	6	38
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1	3		5	1			4											1	1	1			1					1		1		1							1	4
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	57	44		66	33	2	48	51	2					1	1		9	20	12	8	17	9	3	10	5	2	1		11	9	13	14	4	5	9	8	7	13	4	4	101
4. Syphilis																																									
5. Cancer	14	31		12	32	1	1	42	2								1	1			3	5	2	16	7	7	2	1	2	5	7	2	4	6	2	4	2	1	4	6	45
6. Rheumatism and Gout	1	4		4	1		1	1							1									3	1						1	1	1				1		1		5
7. Diabetes	2	1		2	1			3										1			1			1					1								1			1	3
8. Other General Diseases	6	4		3	7			10											1			1	1	1	4	1	1				2		2	1		1		1	1	2	10
9. Alcoholism, Acute and Chronic																																									
Total	81	87		90	75	3	50	114	4					1	5		10	22	14	9	22	15	6	32	17	10	4	1	15	14	24	17	12	12	11	13	11	15	10	24	168
Local Diseases																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis		2		1	1		1	1										1							1				1							1					2
2. Simple Meningitis	10	9		17	2		17	2		7	2	1	1		1	2	2			1				1		1			2	2		1	1	2	2	3	1	2		3	19
3. Epidemic Cerebro-spinal Meningitis	2			1	1		2						1					1																						2	2
4. Congestion and Hemorrhage of Brain	27	17		13	31		6	38											1	1	1	2	2	4	12	9	2		1	6	1	3	1	2	3	6	6	4	5	6	44
5. Softening of the Brain	1	4		2	3		1	4												1					2	2				1	1					1			2		5
6. Paralysis without specified cause	10	9		10	9		3	16											1	1	1		3	2	4	5	2		2	2	3	1	3		2			1	2	3	19
7. Insanity																																									
8. Epilepsy	2			1		1		1	1															1				1		1		1									2
9. Convulsions (not puerperal)	5	2		7			6		1	4	1		1									1							1			1	2		1	2					7
10. Other Nervous Diseases	2	1		2	1		1	2										1							2					1	1					1					3
Total	59	44		54	48	1	37	64	2	11	3	1	3		1	2	2	3	2	4	2	3	5	8	21	27	4	1	7	13	6	7	7	4	8	14	7	7	9	14	103

IV. CIRCULATORY SYSTEM.											
1. Pericarditis	1	...	...	...	1	...	...	1	...	1 1	1
2. Endocarditis	2	3	...	5	...	...	4	1	...	2 1 1 1 2 1 1 1	5
3. Organic Heart Diseases	30	24	...	20	33	1	14	37	3	1 2 2 1 2 3 11 15 10 3 4 3 10 8 8 4 2 1 6 3 3 5	54
4. Angina Pectoris	1	1	...	1	...	1	1	...	1	1 1 1 1	2
5. Arteries, Atheroma, Aneurism, etc.	3	4	...	1	6	...	2	5	...	1 1 1 1 1 1 2 3	7
6. Other Diseases of Circulatory System	...	...	...	...	...	...	...	...	...	...	...
Total	37	32		27	40	2	21	44	4	3 3 3 1 1 2 1 13 17 14 4 4 7 10 9 8 6 3 3 1 6 4 4 5	69
V. RESPIRATORY SYSTEM											
1. Acute Bronchitis	7	11		12		...	9	8	1	9 1 2 1 3 2 3 3 1 1 4 1 3 2	18
2. Chronic Bronchitis	1	8	...	3	9		1	11	...	1 1 1 2 7 3 1 1 1 1 2 1	12
3. Broncho pneumonia	7	6		7	6		6	7	...	2 2 3 2 2 2 1 3 2 2 1 2 1 1	13
4. Pneumonia	16	32	...	38	37	3	27	49	2	8 4 1 2 1 1 2 2 6 6 8 15 13 8 1 11 14 2 8 11 7 3 2 6 2 3 9	78
5. Pleurisy	5	9		8	4		3	9	...	1 1 1 2 1 3 1 2 2 2 3 1 1 2 1	12
6. Congestion of the Lungs (inc. pul. apoplexy)	6	2		2	6	...	2	5	1	2 1 2 3 2 1 2 1 1 1	8
7. Asthma and Emphysema	1	1	...	2	...	...	...	2	...	1 1 1 1	2
8. Other Diseases of Respiratory System	...	...	...	...	...	...	...	...	...	...	...
Total	74	69	...	73	67	3	48	91	1	22 6 1 1 2 2 2 4 3 7 9 16 24 21 20 3 22 24 10 12 20 10 4 2 11 8 6 14	143
VI. DIGESTIVE SYSTEM											
1. Ulcer of the Stomach	2	2		2	2	...	3	1	...	1 1 1 1 1 1 1 1	4
2. Other Diseases of Stomach (cancer excepted)	4	3	...	3	3	1	1	5	1	1 4 1 1 3 1 1 1 1	7
3. Infant. Diarr. and Gastro Ent. (cholera infan.)	12	10		22	...		22	...	...	18 4 1 1 2 1 12 4 1	22
4. Diarrhoea and Enteritis (not infantile)	2	4		4	2		3	2	1	1 1 1 1 1 2 1 2	6
5. Dysentery	...	...	...	...	...	...	...	...	...	...	...
6. Hernia and Intestinal obstructions	1	3	...	1	3	...	...	4		1 1 2 1 2 1	4
7. Other Diseases of the Intestines	1	[illegible]			4			4		1 1 1 1 1 1 1 1	4
8. Diseases of the Liver	7	1		4	4	...	4	4	...	1 1 1 2 3 1 1 1 2 1 1 2	8
9. Peritonitis (not puerperal)	4	6		7	3		4	6		1 1 3 1 1 1 1 1 1 1 2 2 1 3	10
10. Iliac Abscess and Appendicitis	3	[illegible]	...	4	1	1	3	3	...	1 1 1 2 1 1 1 1 2 1	6
Total	36	35		47	22	2	40	29	2	18 4 1 2 1 1 2 1 6 2 2 2 3 2 10 6 7 1 7 4 6 6 9 3 16 8 2 6 3	71
VII. GENITO-URINARY SYSTEM											
1. Acute Nephritis	3	1	...	3	1		1	3		1 1 2 2 1 1	4
2. Bright's Disease	17	14	...	11	19	1	4	22	5	1 1 1 1 2 3 1 5 6 7 3 2 2 2 3 5 5 1 2 3 2 2 2	31
3. Other Diseases of the Kidneys and Adnexa	...	1	...	1	...	...	...	1	...	1 1	1
4. Vesical Calculi	...	...	...	...	...	...	...	...	...	...	...
5. Diseases of the Bladder	6	...	...	3	3	...	...	6	...	1 2 1 2 2 1 2 1	6
6. Diseases of the Male Genital Organs	1	...	...	...	1	...	...	1	...	1 1	1
7. Metritis	...	...	...	...	...	...	...	...	...	...	...
8. Other Diseases of the Uterus	...	...	...	...	...	...	...	...	...	...	...
9. Ovarian Cysts and other Ovarian Tumors	...	...	...	...	...	...	...	...	...	...	...
10. Other Diseases of Female Genital Organs	...	2	...	2	...	...	...	2	...	1 1 1 1	2
Total	27	18	...	20	21	1	5	35	5	1 1 1 3 3 5 3 5 9 9 5 2 2 3 5 8 7 2 3 5 5 2 3	45
VIII. PUERPERAL DISEASES											
1. Puerperal septicaemia	...	2	...	2				2	...	1 1 2	2
2. Puerperal Albuminuria and Convul.	...	1	...	1	...			1		1 1	1
3. Other accidents of Pregnancy, sudden death	...	[illegible]		2	1			3		1 1 1 1 1 1	3
4. Puerperal Diseases of the Breast	...	...	...	...	...			...	...	...	...
Total	...	6		5	1	...	...	6	...	1 1 2 2 3 1 1 1	6

HAMILTON.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN																																									
1. Erysipelas	4	3		4	3		4	3		3												1		1	2				4	1	1	1									7
2. Skin and Adnexa (cancer excepted)	1				1			1																	1										1						1
Total	5	3		4	4		4	4		3												1		1	3				4	1	1	1			1						8
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified Disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	36	32	8	76			76			76																			2	7	8	7	7	7	5	4	5	7	8	9	76
2. Congen. Debil. and Malformations	40	25	4	69			69			66	2				1														6	10	5	7	8	5	4	6	1	7	2	5	69
3. Other Diseases of Infancy		2		2			2				2																							2							2
4. Senile Decay	33	27		6	52	2	5	54	1																	30	30		10	13	7	2	5	3	2	3	5	3	7		60
Total	109	86	12	153	52	2	152	54	1	112	4				1											30	30		18	30	20	16	20	17	11	13	14	17	17	14	207
XII. SUICIDE																																									
1. Poison																																									
2. Strangulation		1		1				1																	1													1			1
3. Gas Poisoning																																									
4. Drowning		1		1				1													1												1								1
5. Firearms																																									
6. Not stated		1		1			1															1										1									1
Total		3		3			1	2													1	1			1							1	1					1			3
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	2	2		3	1		2	2							1					1		1				1						1				2	1				4
2. Gunshot																																									
3. Lightning																																									
4. Drowning	3			3			3										3																		2	1					3
5. Electric Cars	1	2		3	1		2	1				1		1					1															1	1	1					3
6. Bicycles																																									
7. Railways	5			1	4		3	2										2			1		1	1									1		2		1			1	5
8. Burns and Scalds	1	2		2	1		2	1			2													1							1			1						1	3
9. Homicide																																									
10. Other accidents	16	3		8	8	3	7	10	2								2	3	1	1	1	2		2	2	1		1	1		2	1	2		3	2	1	3	3	1	19
Total	28	9		19	15	3	19	16	2		2	1		1	1		5	5	5	2	2	3	1	4	2	2		1	1		3	2	3	2	8	6	3	3	3	3	37
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	1			1				1																	1										1						1
2. Tumors	4	8		7	5		1	10	1		1									1	1	1	1		2	2			3		2	2			1	1	1	1	1		12
3. Other Ill-Defined Causes	1	2		3			1	2											1					2							1	1					1				3
4. Heart Failure	7	7		10	2	2	3	10	1							1		1		1	1		2	6	2				1		1		1	2		2	1		1	2	14
Total	13	17		21	7	2	5	23	2		1					1		1	1	2	2	4	3	8	5	2			4		4	3	1	2	2	3	6	1	2	2	30
Total from all causes	490	426	12	541	368	19	408	493	27	198	22	7	11	4	22	8	24	44	30	32	39	43	34	98	107	124	69	12	90	106	85	84	87	69	54	75	73	66	60	79	928

CAUSES OF DEATHS BY CITIES IN 1904.—OTTAWA.

General Diseases.	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Social Con. Single.	Married.	Not stated.	Ages. Under 5. 0.1	1.	2.	3.	4.	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given.	Months. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES																																									
1. Typhoid Fever	7	6		11	2		7	6							1	1	1	2	1	4			2			1						1				1	3	4	2	2	13
2. Smallpox																																									
3. Measles	2	3		5			5				4				1																					1	1		1	2	5
4. Scarlet Fever	1	2		3			3					1		1	1														1									1		1	3
5. Whooping Cough	5	4		9			9			4	3	1	1																3	2		1			1		2				9
6. Diphtheria and Croup	5	1		6			5		1		1	2	1	1				1											2	1			2					1			6
7. Influenza	1	1		2				1	1											1	1											1	1								2
8. Other Epidemic Diseases																																									
Total	21	17		36	2		29	7	2	4	8	4	2	2	3	1	1	3	1	5	1		2			1			6	3		3	3		1	2	6	6	3	5	38
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia	3	2		3	1	1		4	1									1		1			1		1	1			1			1	1			1		1			5
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	58	56		92	15	7	66	40	8		4	1	1	1	5	5	17	18	9	10	14	10	3	12	2	1	1		5	8	14	15	8	10	6	13	4	13	12	6	114
4. Syphilis	3			3			3			2				1															1											2	3
5. Cancer	13	27		24	15	1	5	30	5											1	2	1	6	8	14	4	4		5	5	2	3	2	5	2	4	4	3	1	4	40
6. Rheumatism and Gout		2		1	1		2										1		1													1								1	2
7. Diabetes	1	4		4	1		2	2	1										1			1		3					1	1		1	1	1							5
8. Other General Diseases	4	6		8	2		1	8	1									1	1	1	2		1	1	1	2			1		2		2	3		1		1			10
9. Alcoholism, Acute and Chronic		2		1		1		1	1											1	1																1	1			2
Total	82	99		136	35	10	79	85	17	2	4	1	1	2	5	5	18	20	12	14	19	12	11	24	18	8	5		14	14	18	21	14	19	8	19	9	19	13	13	181
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis		1		1			1																			1													1		1
2. Simple Meningitis	8	12		19	1		17	3		6	2	5		1	2						1	1	1	1					1	3	1	1	1	2	2	2	1	2	2	2	20
3. Epidemic Cerebro-spinal Meningitis	1	5		6			5	1		1		1		1		1		1	1										1	1		1	1	1					1		6
4. Congestion and Hemorrhage of Brain	14	15		16	12	1	3	21	5										1				1	2	10	10	5		3	2	3	4	4	1	5	1	2	2	2		29
5. Softening of the Brain		1		1				1															1												1						1
6. Paralysis without specified cause	17	15		21	11		1	24	7										1	1		2	1	4	8	5	10		2	4	2	3	5	2		2	2	3	3	4	32
7. Insanity		2			2				2																		2		1			1									2
8. Epilepsy		2		1	1		2								1									1										1			1				2
9. Convulsions (not puerperal)	15	15		30			30			20	9				1														3	3	3	1	6	1	4	1	2	3	3		30
10. Other Nervous Diseases																																									
Total	55	68		95	27	1	59	50	14	27	11	6		2	4	1		1	3	1	1	3	4	8	18	16	17		11	13	9	11	17	8	12	6	8	10	12	6	123

OTTAWA.—*Continued*.

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis	1				1			1																	1						1										1
2. Endocarditis	6	7		11	2		6	4	3						2	1	2				1	2			2	1	2		3	2			2		1			2	2	1	13
3. Organic Heart Diseases	20	31		30	20	1	8	37	6							1	1	1	2		2	1	2	10	12	9	10		1	5	7	3	7	5	5	2	3	2	2	9	51
4. Angina Pectoris	1				1			1																	1											1					1
5. Diseases of Arteries, Atheroma, Aneurism, etc.	1	1			2			1	1																	2														2	2
6. Other Diseases of Circulatory System	1			1					1															1										1							1
Total	30	39		42	26	1	14	44	11						2	2	3	1	2		3	3	2	11	16	12	12		4	7	8	3	9	6	6	3	3	4	4	12	69
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	18	7		18	6	1	17	8		12	1	2													2	4	1		4	8	1	1	1				1	1	2	3	25
2. Chronic Bronchitis	8	1		6	2	1	1	6	2										1			1		2	5				1	1	1		1		1	1	1		1	1	9
3. Broncho-Pneumonia	10	13		19	3	1	18	4	1	10	7					1			1					1	1	1	1		6	4	1	1	4	1		1	1	1	1	2	23
4. Pneumonia	46	27		53	19	1	35	30	8	7	3	5			3	1	2	3	2	5	4	2	5	9	11	4	4		4	10	9	6	8	5	2	1	2	3	7	16	73
5. Pleurisy	5	5		6	1		5	2	3	1	1				1	1			2					1	1	2			1	1	2				1		1	2	1	1	10
6. Congestion of the lungs (inc. pul. apoplexy)	3	2		2	2	1	2	3			1	1		1											1	1				1	1	1	1						1		5
7. Asthma and Emphysema	1	1		2					2															1	1					1							1				2
8. Other Diseases of the Respiratory System																																									
Total	91	56		106	36	5	78	53	16	30	13	8		1	4	3	2	3	6	5	4	3	5	11	25	12	9		16	26	18	9	15	6	4	3	7	7	13	23	147
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1	1		2			1	1														1			1				1				1								2
2. Other Dis's. of the Stomach (cancer excepted)	5	3		4	2	2	1	6	1								1				1			1	1	1	3		1	1		1			1	2		1		1	8
3. Infan. Diarr. and Cholera Infantum	57	36		93			93			91	2																		5	2	3	3	3	7	27	25	11	4	3		93
4. Diarrhœa and Enteritis (not Infantile)	2	2		4			4					3			1																	3		1							4
5. Dysentery																																									
6. Hernia and Intestinal obstructions	6	2		5	2	1	1	5	2											2	1				3	2			2		1	1	1				2			1	8
7. Other Diseases of the Intestines	3	2		1	1		2	3			1								1	1	1				1					2						2				1	5
8. Diseases of the Liver	9	5		10	4		1	8	2						1							1	2	1	5	3	1			2	2	1	3		1	1	2		2		11
9. Peritonitis (not puerperal)	10	11		20	1		12	9						1	1	4	2	3		2	1	1	2	2	2				1		4	3	2		4		2	3		2	21
10. Iliac Abscess and Appendicitis	8	4		12			7	4	1						3	2	2	1			2		1		1				1			1	1	2	5		2				12
Total	101	66		151	10	3	125	36	6	94	3	3		1	6	6	5	1	1	5	6	3	5	4	14	6	4		11	7	10	13	11	10	38	30	19	8	5	5	167
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	7	1		8	3		5	6		2					1						1	1	1		4	1				1	2		1	2	1	3	1				11
2. Bright's Disease	8	5		11	2		3	8	2											1		1	1	3	2	5			2	3		1	1		2		1	1	2		13
3. Other Diseases of Kidneys and Adnexa	1	1		1	1			2																		1	1			1									1		2
4. Vesical Calculi																																									
5. Diseases of the Bladder	4			4			1	3													1				1	1	1				2		1					1			1
6. Diseases of the Male Genital Organs	1			1				1												1																				1	1
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs	1	2		2	1			2	1										2					1					1											2	3
Total	22	12		27	7		9	22	3	2					1				2	2	2	2	2	4	7	8	2		3	5	4	1	3	2	3	3	2	2	3	3	34

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia		1		1				1													1												1								1
2. Puerperal Albuminura and Convulsions		4		4				4									1			1	2								1					2				1			4
3. Other Accidents of Pregnancy, sudden death		1		1				1											1																					1	1
4. Puerperal Diseases of the Breast																																									
Total		6		6				6									1		1	1	3								1				1	2				1		1	6
IX. THE SKIN.																																									
1. Erysipelas		1		1			1			1																														1	1
2. Skin and Adnexa (cancer excepted)																																									
Total		1		1			1			1																														1	1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease		1		1				1										1												1											1
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified disease)																																									
Total		1		1				1										1												1											1
XI. MALFORMATIONS, ETC.																																									
1. Still Births	45	45		90			90			90																			7	12	4	5	6	10	9	6	5	10	9	7	90
2. Congen. Debility and Malformation	106	85		191			191			191																			15	20	19	20	19	18	26	10	7	16	13	8	191
3. Other Diseases of Infancy	8	3		11			11			7	3	1																	2	2	1	1	2			1	1		1		11
4. Senile Decay	42	10		43	39		7	59	16																7	30	45		7	10	5	5	12	6	4	6	5	11	4	7	82
Total	201	173		335	39		299	59	16	288	3	1													7	30	45		31	44	29	31	39	34	39	23	18	37	27	22	374
XII. SUICIDE.																																									
1. Poison	1			1				1																1										1							1
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total	1			1				1																1										1							1
XIII. ACCIDENT.																																									
1. Fractures and Dislocations	4			4			1	3									1		1	1					1								1	1		1				1	4
2. Gunshot	2			2			1	1								1							1															1	1		2
3. Lightning																																									
4. Drowning	3	1		3		1	3	1								1	1	1				1										1	2	1							4
5. Electric Cars	3			3			2	1							1		1			1														2					1		3
6. Bicycles																																									
7. Railways	6			5		1	2	1	3				1					2	2		1									3			1	1	1						6
8. Burns and Scalds	1			1			1											1												1											1
9. Homicide																																									
10. Other Accidents	6	4		7	2	1	6	4							1	1	2	1		1	2			1	1					1		3			1	2	1	1		1	10
Total	25	5		25	2	3	16	11	3				1		2	3	5	5	3	3	3	1	1	1	2					5		4	4	5	2	3	1	2	2	2	30
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy	4	4		8				7	1													1				4	3					1	1	1	2	1			1	1	8
2. Tumors	6	8		13	1		7	5	2							1	1	2	1	2	1	3		1	1		1			2	1		4	2	2	1			1	1	14
3. Other Ill-Defined Causes	4	10		11	2	1	5	6	3					1	1	1			2	4			1	2	1			1	1	1			2	1	1	2	3	1	1	1	14
4. Heart Failure	18	8		21	5		9	13	4								2	2	2	1	1	3	3	8	4				1	2	2	4	6			4		1	1	2	26
Total	32	30		53	8	1	21	31	10					1	1	2	3	4	5	7	2	7	4	11	6	4	4	1	5	5	3	5	13	4	5	8	3	2	4	5	62
Total from all causes	661	573		1,018	192	24	730	406	98	446	42	23	4	9	28	33	38	42	36	33	44	34	36	77	113	97	98	1	102	130	99	101	129	77	118	100	76	98	86	98	1,234

CAUSES OF DEATHS BY CITIES IN 1904.—LONDON.

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign	Nativity. Not stated.	Soc'l con. Single.	Soc'l con. Married.	Soc'l con. Not stated.	Ages. Under 5. 0	1	2	3	4	5-9	10-14.	15-19	20-24	25-29	30-34	35-39	40-44.	45-49.	50-59	60-69	70-79.	80 and over	Not given	Months. January	February	March	April	May.	June	July.	August.	September	October.	November	December	Totals.
Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	8	9		14	3		8	9								3	2	3	2	2		1	1	2	1				1	1		1				4	6	1	1	2	17
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	4	3		6	1		7					3	1	2	1																	2		1		1			1	2	7
5. Whooping Cough	3			3			3			2	1																				1					2					3
6. Diphtheria and Croup	12	9		21			20		1	1	4	1	2	2	7	1	1				1							1	1	5	2	1	2	3	1		3		1	2	21
7. Influenza	3	2		3	2			5																1	1		3		1	1	1	1								1	5
8. Other Epidemic Diseases																																									
Total	30	23		47	6		38	14	1	3	5	4	3	4	8	4	3	3	2	2	1	1	1	3	2		3	1	3	7	4	5	2	4	1	7	9	1	3	7	53
II. OTHER GENERAL DISEASES.																																									
1. Pyæmia and Septicæmia	2	1		2	1		1	1	1												1				1		1			2			1								3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	28	34		48	14		35	26	1		1		1			3	7	10	10	9	4	3	5	5	1	1	2		6	6	4	6	8	3	10	6	3	4	5	1	62
4. Syphilis																																									
5. Cancer	16	26		19	23		5	37				1			1					2	1	3	5	7	10	8	4		6	5	4	6	3		2	3	4	1	5	3	42
6. Rheumatism and Gout	2	4		4	2		1	5										1			2	1		1	1						3	1							1	1	6
7. Diabetes	2	4		6			2	3	1									2	1			1	1			1			1					2	2				1		6
8. Other General Diseases	5	9		11	3		4	10				1				1				2			2	2	2	3	1			2	2	2	1	1	1	2	1	1		1	14
9. Alcoholism, Acute and Chronic																																									
Total	55	78		90	43		48	82	3		1	2	1		1	4	7	13	11	13	8	8	13	15	15	13	8		13	15	13	15	13	6	15	11	8	6	12	6	133
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	3			2	1		2	1		1					1										1					1						2					3
2. Simple Meningitis	2	4		6			5	1		3	1		1											1					1	1	1	1		1				1			6
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	10	10		7	13		3	16	1													1	1	2	5	7	4		2	1	4		1	3			1	3	4	1	20
5. Softening of the Brain	2				2			2																1		1			1							1					2
6. Paralysis without specified cause	8	10		12	6		2	16										1				1	1	2	4	6	3		2	1	1	1	4				2	2	2	3	18
7. Insanity																																									
8. Epilepsy	1				1		1											1																		1					1
9. Convulsions (not puerperal)	11	4		15			15			14	1																				1	2	1	4		3	2	1	1		15
10. Other Nervous Diseases	2	3		4	1		1	4								1					1		2			1			1			1	1				1			1	5
Total	39	31		46	24		29	40	1	18	2		1		1	1		2			1	2	4	6	10	15	7		7	4	7	5	7	8		7	6	7	7	5	70

IV. CIRCULATORY SYSTEM.												
1. Pericarditis	....	1	...	1	....	...	....	1	....	1	1	1
2. Endocarditis	2	1	...	3	....	...	3	....	...	1 1 1	1 1 1	3
3. Organic Heart Diseases	16	25	....	16	25	....	9	32	....	1 1 1 3 2 8 12 10 3	4 7 3 6 4 1 1 7 2 3 3	41
4. Angina Pectoris	4	....	....	2	2	....	....	4	....	2 1 1	1 2 1	4
5. Arteries, Atheroma, Aneurism, etc.	2	1	....	1	2	....	....	3	....	1 2	1 1 1	3
6. Other Diseases of Circulatory System	....	1	....	1	...	....	1	....	...	1	1	1
Total	24	29	....	24	29	....	13	46	....	1 1 1 2 1 1 4 2 10 13 13 4	5 7 3 6 6 3 1 2 8 4 4 4	53
V. RESPIRATORY SYSTEM.												
1. Acute Bronchitis	8	15	....	9	14	...	9	14	....	5 1 1 1 3 10 2	6 4 1 3 3 1 1 1	23
2. Chronic Bronchitis	1	1	...	1	1	...	1	1	....	1 1	1 1	2
3. Broncho-pneumonia	1	....	....	1	....	....	1	....	....	1	1	1
4. Pneumonia	25	19	...	21	20	...	15	28	1	5 3 1 1 1 2 3 3 3 5 10 4 3	5 9 4 5 6 4 1 6 4	44
5. Pleurisy	3	....	....	2	1	..	2	1	...	1 1 1	2 1	3
6. Congestion of the Lungs, (inc. pul. apoplexy)	1	1	....	1	1	..	1	1	...	1 1	1 1	2
7. Asthma and Emphysema	4	....	....	....	4	....	....	4	...	2 1 1	1 2 1	4
8. Other Diseases of Respiratory System	...	...	...	....	....	....	....	....	....			......
Total	43	36	....	38	41	....	29	49	1	13 1 3 1 1 1 2 3 1 3 4 7 16 16 7	12 11 11 9 10 1 4 3 3 6 6	79
VI. DIGESTIVE SYSTEM.												
1. Ulcer of the Stomach	....	2	...	2	...	...	1	1	..	1 1	1 1	2
2. Other Dis's. of the Stomach (cancer excepted)	2	3	....	4	1	....	3	2	....	2 1 1 1	1 1 1 2	5
3. Infan. Diarr. and Cholera Infantum	18	8	....	26	....	....	26	....	....	22 4	1 1 1 6 12 4 1	26
4. Diarrhœa and Enteritis (not Infantile)	4	2	...	5	1	....	3	2	1	1 2 1 1 1	1 2 1 2	6
5. Dysentery	1	...	...	....	1	...	....	1	..	1	1	1
6. Hernia and Intestinal obstructions	5	2	...	4	3	..	4	3	..	2 1 2 2	1 1 1 1 2 1	7
7. Other Diseases of the Intestines	1	....	....	..	1	....	....	1	..	1	1	1
8. Diseases of the Liver	3	5	..	1	7	....	1	6	1	1 1 2 3 1	1 2 1 3 1	8
9. Peritonitis (not puerperal)	...	2	....	1	1	...	1	1	....	1 1	1 1	2
10. Iliac Abscess and Appendicitis	5	2	....	7	...	...	3	4	...	1 1 1 1 1 2	1 2 3 1	7
Total	39	26	..	50	15	...	42	21	2	22 4 2 1 2 4 5 1 5 1 1 1 5 9 2	2 2 5 2 3 6 14 13 12 2 4	65
VII. GENITO URINARY SYSTEM.												
1. Acute Nephritis	2	....	....	1	1	....	1	1	..	1 1	1 1	2
2. Bright's Disease	7	14	....	10	10	1	3	18	....	1 1 1 1 2 5 2 5 3	1 3 1 1 1 2 2 3 3 3 1	21
3. Other Diseases of Kidneys and Adnexa	8	2	...	5	5	..	....	10		1 1 5 5	1 2 1 2 1 2 1	10
4. Vesical Calculi	...	...	....	....	....	....	...	....	..			....
5. Diseases of the Bladder	1	2	....	....	3	....	....	3	..	1 2	1 1 1	3
6. Diseases of the Male Genital Organs	....	...	....	....	....	....	...	....	....			...
7. Metritis	....	....	....	....	....	....	....	....	....			...
8. Other Diseases of the Uterus	...	....	....	....	....	....	....	....	..			......
9. Ovarian Cysts and other Ovarian Tumors	....	...	....	....	....	....	...	...	...			....
10. Other Diseases of the Female Genital Organs	....	1	..	....	1	...	..	1	.	1	1	1
Total	18	19	....	16	20	1	1	33	...	1 1 1 1 1 4 1 5 4 12 6	3 5 3 1 1 2 4 2 4 5 5 2	37
VIII. PUERPERAL DISEASES.												
1. Puerperal Septicaemia	...	....	....	..	....	....	....	...				......
2. Puerperal Albuminuria and Convulsions	....	1	....	1	....	...	..	1	...	1	1	1
3. Other Accidents of Pregnancy, sudden death	....	1	...	....	1	....		1	..	1	1	1
4. Puerperal Disease of the Breast	....	....	....	....	...	...	....	....	...			....
Total	....	2	...	1	1	....	...	2	....	2	1 1	2

LONDON.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	3	1		3	1			4															1	2			1			1	2									1	4
2. Skin and Adnexa (cancer excepted)		1			1			1															1																1		1
Total	3	2		3	2			5															2	2			1			1	2								1	1	5
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation for unspecified Diseases																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	22	12		34			34			34																			6	5	4	2	5			1	3	5	2	1	34
2. Congen. Debil. and Malformations	30	17		17			47			17																			1	6	5	5	3	3	2	5	5	4	5	3	47
3. Other diseases of Infancy	1			1			1				1																										1				1
4. Senile Decay	29	28		8	49		5	51	1																1	27	29		6	6	4	7	3	2	3	2	5	8	8	3	57
Total	82	57		90	49		87	51	1	81	1														1	27	29		13	17	13	14	11	5	5	8	14	17	15	7	139
XII. SUICIDE.																																									
1. Poison	1			1				1														1													1						1
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning		1		1				1															1																1		1
5. Firearms	1			1				1																1																1	1
Total	2	1		3				3														1	1	1											1				1	1	3
XII. ACCIDENTS.																																									
1. Fractures and Dislocations	5	3		5	5		2	6							1					1				1	2	1	2		2			1	1	2				2			8
2. Gunshot	2			1		1	1	1											1			1								1							1				2
3. Lightning																																									
4. Drowning	1			1			1				1																											1			1
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	6			5	1		2	1							1				1		3				1				2	1		1					1			1	6
8. Burns and Scalds		1		1			1						1																											1	1
9. Homicide		1		1			1			1																					1										1
10. Other accidents	6	1		7	2	1	4	6										1	2	2				3	2				3		1				1				1	4	10
Total	20	9		19	8	2	12	17		1	1		1		2			1	4	3	3	1		4	5	1	2		7	2	2	2	1	2	1		2	3	1	6	29
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	2	2			1			1														1		1		1	1				1			1		1		1			4
2. Tumors	2	2		1	3			1														1	1	1	1							1	2		1						4
3. Other Ill-defined Causes	2	4		4	2		2	3	1						1					2				2		1							1				2		1	2	6
4. Heart Failure	4	4		3	5		4	4									1					2		2	3						1			1	2	1	1	1	1		8
Total	10	12		8	14		6	15	1						1		1			2		4	1	6	4	2	1				2	1	3	2	3	2	3	2	2	2	22
Total from all causes	365	325	....	435	252	3	308	372	10	139	15	11	8	6	16	10	15	25	28	29	20	25	30	60	75	108	70	.	65	74	65	60	54	36	42	56	67	61	59	51	690

CAUSES OF DEATHS BY CITIES IN 1904.—KINGSTON.

General Diseases.	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Soc'l con. Single.	Married.	Not stated.	Ages. Under 5. 0-1	1-	2-	3-	4-	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over	Not given	Months. January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	3	1		1			1	3										1	1		2														1	2				1	4
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	1	6		7			7			2	2						2		1										1	1	2	1	1	1							7
7. Influenza	1	1		2			1	1		1																1									2						2
8. Other Epidemic Diseases																																									
Total	5	8		13			9	1		3	2						2	1	2		2					1			1	1	2	1	1	1	3	2				1	13
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	3	1		2	2		1	3									1				1				2				1		1		1					1			4
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	17	18		25	6	4	17	16	2		1				1	1	3	9	1	1	4	1	2	1	2	2			1	6	2	2	1	1	5	4	3	1	3	3	35
4. Syphilis																																									
5. Cancer	7	10		6	9	2	1	13	3										1		1		1	3	9	1		1	1	1	2	1	2	1	1	2	2	2	1	1	17
6. Rheumatism and Gout	1	4		2	3		3	2													2			1	2				2						1	1		1			5
7. Diabetes	2	2		1	3		2	2											2		1				1					1	1	1		1							4
8. Other General Diseases	1	4		2	2	1	1	3	1									1			1			1	1		1		1	1	1							1	1		5
9. Alcoholism, Acute and Chronic																																									
Total	31	39		38	25	7	25	38	6		1				1	1	4	10	7	4	10	1	3	6	17	5	1	1	6	9	7	1	4	6	7	7	5	6	5	4	70
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1			1			1					1																				1									1
2. Simple Meningitis	5	4		9			8	1		5	1					1		1							1						1		1		2	2	2	1			9
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	2	8		7	2	1	6	4		1		1			1			1					1		3		2		1	2	4					1	1			1	10
5. Softening of the Brain																																									
6. Paralysis without specified cause	11	11		8	14		6	14	2										1				1	2	6	11	1		2	1	2	1	1	3	1	2	1	2	3	3	22
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	4			4			4			4																									2	2					4
10. Other Nervous Diseases	1	1		2				2																2						1			1								2
Total	24	24		31	16	1	25	21	2	10	1	2			1	1		2	1				2	4	10	11	3		3	4	7	2	3	3	5	7	4	3	3	4	48

KINGSTON.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																																									
1. Pericarditis	1			1			1									1																	1								1
2. Endocarditis	2				1			2																	1	1							2								2
3. Organic Heart Diseases	14	16		14	15	1	10	16	4									1	1		1	3	2	2	10	5	5		4	4	3		2	2	2	1		4	2	6	30
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System																																									
Total	17	16		16	16	1	11	18	4							1		1	1		1	3	2	2	11	6	5		4	4	3		5	2	2	1		4	2	6	33
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis	1				1			1																		1											1				1
2. Chronic Bronchitis	1				1			1																		1													1		1
3. Broncho pneumonia	1				1			1																	1					1											1
4. Pneumonia	10	9		15	4		12*	5	2	10						1			1						3	1	3		1	3	1	1	3			1	1	1	5	2	19
5. Pleurisy	1			1			1																1									1									1
6. Congestion of the Lungs	1	1		1	1		1	1		1															1											1				1	2
7. Asthma and Emphysema	1			1			1																		1								1								1
8. Other Diseases of Respiratory System																																									
Total	16	10		18	8		15	9	2	11						1			1				1		6	3	3		1	4	1	2	4			2	2	1	6	2	26
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	2	3		3	1	1	2	3												1		1		1	1	1			1	1	1			1					1		5
3. Infantile Diarrhoea and Cholera Infantum	4	4		8			8			8																										3	3		1	1	8
4. Diarrhoea and Enteritis (not infantile)	1	1		1	1		1	1																1			1		1							1					2
5. Dysentery																																									
6. Hernia and Intestinal obstructions	3	2		4	1		4	1			1				1							1			1	1				1		1	1			1			1		5
7. Other Diseases of the Intestines		1			1			1														1																	1		1
8. Diseases of the Liver	2	3			5		1	4																	2	2		1		1		1			1			1		1	5
9. Peritonitis (not Puerperal)		1		4			2	2							1	1			1							1										2		1		1	1
10. Iliac Abscess and Appendicitis	2	5		7			5	1	1						1	3					2		1						1				1	1	1				1	2	7
Total	14	23		27	9	1	23	13	1	8	1				3	4			1	1	2	3	1	2	4	5	1	1	3	3	1	2	2	2	2	7	3	2	5	5	37
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	5	1		2	4			6																2	1	3				1		2	2			1					6
3. Other Diseases of Kidneys and Adnexa	1	1		1	1			2													1						1				1						1				2
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the female Genital Organs																																									
Total	6	2		3	5			8													1			2	1	3	1			1	1	2	2			1	1				8
PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									

2. Puerperal Albuminuria and Convulsions																																								
3. Other Accidents of Pregnancy, sudden death		3		3				3										1		1	1										1		2							3
4. Puerperal Disease of the Breast																																								
Total		3		3				3										1		1	1										1		2							3
IX. THE SKIN.																																								
1. Erysipelas	1				1				1																1							1								1
2. Skin and Adnexa (cancer excepted)																																								
Total	1				1				1																1							1								1
X. LOCOMOTOR SYSTEM.																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation for unspecified Diseases																																								
Total																																								
XI. MALFORMATIONS, ETC.																																								
1. Still Births	5	4	3	12			12			12																		1	1	1	2	1	1	1	1	1	1		1	12
2. Congenital Debility and Malformations	15	15	1	31			31			31																		5	2	5	1		2	2	6	5	1	1	1	31
3. Other Diseases of Infancy																																								
4. Senile Decay	21	27		17	30	1	7	38	3															8	13	27		5	4	4	8	5	1	2	4	6		4	2	48
Total	41	46	4	60	30	1	50	38	3	43														8	13	27		11	7	10	11	6	7	5	11	12	2	5	4	91
XII. SUICIDE.																																								
1. Poison																																								
2. Strangulation																																								
3. Gas Poisoning																																								
4. Drowning																																								
5. Firearms																																								
Total																																								
XIII. ACCIDENT.																																								
1. Fractures and Dislocations	1	1		1	1			2													1				1			1										1		2
2. Gunshot																																								
3. Lightning																																								
4. Drowning	1	1		1	1		1		1										1					1									1						1	2
5. Electric Cars																																								
6. Poison	1			1			1									1												1												1
7. Railways	2			2			2							1						1											1							1		2
8. Burns and Scalds																																								
9. Homicide																																								
10. Other accidents	1	2		1	2			3												1			1			1		1								2				3
Total	6	4		6	4		4	5	1					1		1			1	2	1		1	1	1	1		3			1		1			2		2	1	10
XIV. ILL DEFINED CAUSES.																																								
1. Dropsy	5	2		5	2			7														1	1	2	2	1		2			1	2					2			7
2. Tumors	2	1		3			3			1						2													1		1			1						3
3. Other Ill-defined Causes	1	2		2	1		1	2															1	1			1			1				1		1				3
4. Heart Failure	4	3		5	2		2	5												1		1	3	2							2			1	2	1		1		7
Total	12	8		15	5		6	14		1						2				1		2	5	5	2	1	1	2	1	1	4	2		3	2	2	2	1		20
Total from all causes	173	183	4	230	119	11	168	172	20	76	5	2	..	6	8	9	14	14	6	20	9	11	22	63	49	43	3	34	34	33	30	30	24	27	40	31	20	29	28	360

CAUSES OF DEATHS BY CITIES IN 1904.—BRANTFORD.

General Diseases	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social con. Single.	Social con. Married.	Social con. Not stated.	Ages. Under 5: 0.1	1.	2	3.	4.	5–9.	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 and over.	Not given.	Months. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	7	2		6	1	2	5	2	2								2	4	1	1								1	1	1					1	3	1		2		9
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	5	2		5	1	1	5		2					1	3	1												2	1	2	3		1								7
7. Influenza	1	2		1	2			3																1	1	1			1	1	1										3
8. Other Epidemic Diseases																																									
Total	13	6		12	4	3	10	5	4					1	3	1	2	4	1	1				1	1	1		3	3	4	1		1		1	3	1		2		19
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1	1		1		1	1		1									1										1										1	1		2
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	4	12		13	3		9	5	2				1				1	1	2	1	1		2	2	1			1	2	1	3	2	1	1	2	1	2			1	16
4. Syphilis																																									
5. Cancer	4	5		5	3	1	1	5	3												2		1	1	1	3	1			2				1			3		1	2	9
6. Rheumatism and Gout																																									
7. Diabetes	1			1			1									1																						1			1
8. Other General Diseases	1	3		3	1		1	2	1									1						1	2								1			1	1	1			4
9. Alcoholism, Acute and Chronic																																									
Total	11	21		23	7	2	13	12	7				1			1	1	6	2	1	3		3	1	1	3	1	2	2	3	3	2	2	2	2	2	6	3	2	3	32
Local Diseases.																																									
III. NERVOUS SYSTEM																																									
1. Encephalitis																																									
2. Simple Meningitis	5	4		8	1		6	1	2	3	2								1	1		1			1				1	1		2	2	1			2				9
3. Epidemic Cerebro spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	3	6		4	4	1	1	7	1								1							3	3	1	1					1	1	3	1	1		1	1		9
5. Softening of the Brain		1				1		1																		1												1			1
6. Paralysis without specified cause	7	5		4	4	4		9	3															2	**3**	3	2	2	1	1	2	2		3		1		1	1		12
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	3	3		6			6			6																					3	1	1		1						6
10. Other Nervous Diseases		1			1			1																1													1				1
Total	18	20		22	10	6	13	19	6	9	2						1		1	1		1		6	7	5	3	2	2	2	5	6	4	7	2	2	3	3	2		38

IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis		1		1				1											1													1									1
2. Endocarditis		1			1				1																	1														1	1
3. Organic Heart Diseases	7	7		7	7		1	11	2											1			1	3	2	4	3		2	2		1			2	1	1	1	2	2	14
4. Angina Pectoris																																									
5. Diseases of Arteries, Atheroma, Aneurism, etc.		1				1		1																1					1												1
6. Other Diseases of the Circulatory System																																									
Total	7	10		8	8	1	1	13	3										1	1			1	4	2	5	3		3	2		2			2	1	1	1	2	3	17
V. RESPIRATORY SYSTEM																																									
1. Acute Bronchitis																																									
2. Chronic Bronchitis		3		3				1	2															1	1		1				1						1	1			3
3. Broncho-pneumonia	1	1		2			1	1			1														1				1			1									2
4. Pneumonia	11	11		13	7	2	6	11	5	2		1			1	1		1	1	1	1		1	3	2	5	1	1	7	5	2	1	2		2				1	2	22
5. Pleurisy		1		1			1																	1																1	1
6. Congestion of the Lungs (inc. pul. apoplexy)																																									
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	12	16		19	7	2	8	13	7	2	1	1			1	1		1	1	1	1		1	5	1	5	2	1	8	5	3	2	2		2		1	1	1	3	28
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach		1		1			1			1																												1			1
2. Other Dis's. of the Stomach (Cancer excepted)	1	1		1		1	1	1																1		1				1										1	2
3. Infan. Diarr. and Cholera Infantum	4	1		5			5			4	1																						1			1	1	1		1	5
4. Diarrhoea and Enteritis (not infantile)	1				1			1																		1			1												1
5. Dysentery	1			1				1																		1										1					1
6. Hernia and Intestinal obstructions	3	2		2	2	1	1	2	2							1								2	1	1			2	1										2	5
7. Other Diseases of the Intestines		1		1				1																1																1	1
8. Diseases of the Liver	2	1		3			1	2												1	1			1					1	1					1						3
9. Peritonitis (not puerperal)	1	2		2	1		1	2		1								1					1							1			1					1			3
10. Iliac Abscess and Appendicitis		1		1			1									1																			1						1
Total	13	10		17	4	2	11	10	2	6	1					2		1		1	1		1	5	1	4			4	4			2		2	2	1	8		5	23
VII. GENITO-URINARY SYSTEM																																									
1. Acute Nephritis	1				1				1																	1			1												1
2. Bright's Disease	1	1		1		1		1	1																	2							1		1						2
3. Other Diseases of the Kidneys and Adnexa		1				1			1																	1						1									1
4. Vesical Calculi																																									
5. Diseases of the Bladder	2	1			3			3																		2		1			1		1						1		3
6. Diseases of the Male Genital Organs	1			1				1																	1													1			1
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	5	3		2	4	2		5	3																1	6		1	1		1	1	2		1			1	1		8
VIII. PUERPERAL DISEASES																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions		1		1				1											1														1								1
3. Other Accidents of Pregnancy, sudden death																																									
4. Puerperal Disease of the Breast																																									
Total		1		1				1											1														1								1

BRANTFORD.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1			1					1																	1						1									1
2. Skin and Adnexa (cancer excepted)																																									
Total	1			1					1																	1						1									1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints	1			1				1																1						1											1
3. Amputation (for unspecified disease)																																									
Total	1			1				1																1						1											1
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	12	8	1	21			21			21																			3	3	1	2	1	1	3			2	4	1	21
2. Congen. Debil. and Malformations	17	16		33			33			33																			6	2	2		1	1	4	2	6	4	2	3	33
3. Other Diseases of Infancy		1		1			1				1																											1			1
4. Senile Decay	14	14		3	22	3	3	17	8																3	10	15		2	2	1	3	6	3	2	2	2	2	2	1	28
Total	43	39	1	58	22	3	58	17	8	54	1														3	10	15		11	7	4	5	8	5	9	4	8	9	8	5	83
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	1			1				1														1																		1	1
2. Gunshot																																									
3. Lightning																																									
4. Drowning	2			1	1		2								2																			2							2
5. Electric Cars	1				1			1																1										1							1
6. Bicycles																																									
7. Railways																																									
8. Burns and Scalds	1	1		2			2								1					1														2							2
9. Homicide																																									
10. Other accidents	4	1		5			2	3									1		1	2	1									1			1					1		2	5
Total	9	2		9	2		6	5							3		1		1	3	1	1		1						1			1	5				1		3	11
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy																																									
2. Tumors	1			1				1															1							1											1
3. Other Ill-Defined Causes	2	3		2	1	2	1	4										1		1					3						1		1			1		1		1	5
4. Heart Failure	4	1		3	1	1	1	3	1														2	1	2						1					2		1		1	5
Total	7	4		6	2	3	2	8	1									1		1			3	1	5					1	2		1			3		2		2	11
Total from all causes	140	132	1	179	70	24	122	109	42	71	5	1	1	1	7	5	5	13	8	10	6	2	9	28	28	40	24	9	34	30	22	19	24	19	21	17	21	24	18	24	273

CAUSES OF DEATHS BY CITIES, IN ST. THOMAS, 1904.

General Diseases.	Sex.			Nativity			Social cond			Ages																			Months												Totals.
										Under 5.																															
	Male.	Female	Not stated.	Canada	Foreign	Not stated.	Single.	Married.	Not stated	0-1.	1.	2.	3.	4.	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given	Jan	Feb.	March	April.	May.	June.	July	Aug	Sept.	Oct	Nov	Dec.	Totals.
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	1	3	...	3	1	...	3	1	...	...					1		1		1		1																1	1		2	4
2. Smallpox	...	...	...	...	...	...	...	...	...	...																															......
3. Measles	...	...	...	...	...	...	...	...	...	...																															......
4. Scarlet Fever	...	...	...	...	...	...	...	...	...	...																															......
5. Whooping Cough	...	...	...	...	...	...	...	...	...	...																															......
6. Diphtheria and Croup.	3	3	...	6	...	...	6	...	...	...					3	1	1	1													1	2		1				2			6
7. Influenza	1	...	...	1	...	...	...	1	...	...																1			1												1
8. Other Epidemic Diseases		...	...	...	...	...	...	...	...	...																															......
Total	5	6	...	10	1		9	2	...	...					1	1	2	1	1		1					1			1		1	2		1			1	3		2	11
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	2	1	...	2	1	...	2	1	...	...							1		1				1						1	1										1	3
2. Malarial Fever	...	...	...	...	...	...	...	...	...	...																															......
3. Tuberculosis and Scrofula	5	2	...	6	1	...	4	3									2		1	3		1							1					3		1			1	1	7
4. Syphilis.	...	...	...	...	...	...	...	...	...	...																															......
5. Cancer	1	4	...	3	2	...	1	4	...	...														1		1					1				1	1			2		5
6. Rheumatism and Gout	...	1	...	...	1	...	...	1	...	...															1															1	1
7. Diabetes	1	...	...	1	...	...	...	1	...	...															1						1										1
8. Other General Diseases	2	...	...	1	1	...	...	2	...	...															1	1								2							2
9. Alcoholism, Acute and Chronic	...	...	...	...	...	...	...	...	...	...																															......
Total	11	8	...	13	6	...	7	12	...	...							3		2	3		1	1	1	3	2			2	1	2			5	1	2			3	3	19
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	2	2	...	1	...	...	1	3	...	1									1	1			1						1			1		1						1	4
2. Simple Meningitis	1	2	...	3	...	...	2	1	...	...		1						1				1												2		1					3
3. Epidemic Cerebro-spinal Meningitis	...	...	...	...	...	...	...	...	...	...																															
4. Congestion and Hemorrhage of Brain	4	4	...	3	5	...	4	4	...	...											1			1	3	2	1			1	1		3		1		1		1		8
5. Softening of the Brain	...	1	...	...	1	...	...	1	...	...															1						1										1
6. Paralysis without specified cause	2	2	...	2	1	1	1	3	...	...																2	2			1			2					1			4
7. Insanity	...	...	...	...	...	...	...	...	...	...																															...
8. Epilepsy	...	...	...	...	...	...	...	...	...	...																															...
9. Convulsions (not puerperal)	3	3	...	6	...	...	6	...	...	5			1																					2			1	1	1	1	6
10. Other Nervous Diseases	2	1	...	3	...	...	2	1	...	1										1	1								1							1	1				3
Total	14	15	...	21	7	1	16	13	...	7		1	1					1	1	2	2	1	1	1	1	1	3		2	2	2	1	5	5	1	2	3	2	2	2	29

ST. THOMAS.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									11
2. Endocarditis																																									1
3. Organic Heart Diseases	8	3		8	3		3	7	1										1	2			1	1	4	1		1		1	1		1	2		1	1	2	1	1	
4. Angina Pectoris	1			1				1													1								1												
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System																																									12
Total	9	3		9	3		3	8	1										1	2	1		1	1	4	1		1	1	1	1		1	2		1	1	2	1	1	
V. RESPIRATORY SYSTEM.																																									3
1. Acute Bronchitis	2	1		2	1		2	1		1																1	1					1			1				1		
2. Chronic Bronchitis																																									1
3. Broncho-pneumonia		1		1			1			1																						1									11
4. Pneumonia	5	6		9	2		4	7		1				2					1				2	2	3				1	2		2	1					1	3	1	
5. Pleurisy																																									
6. Congestion of the Lungs																																									
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	7	8		12	3		7	8		3				2					1				2	2	3	1	1		1	2		4	1		1			1	4	1	15
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)		1		1				1																	1							1									1
3. Infan. Diarrhoea and Cholera Infantum	6	5		8	1		9			8	1																		2							3	3		1		9
4. Diarrhoea and Enteritis (not infantile)																																									
5. Dysentery		2			2			2																		1	1										2				2
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines	1				1		1																	1										1							1
8. Diseases of the Liver	1	2		1	2		1	2													1			1	1				1	2											3
9. Peritonitis (not puerperal)	1	2		6	1		2	1								1	1	1				1		1		1					1	1			1	1			1	1	6
10. Iliac Abscess and Appendicitis		3		3				3															2	1										3							3
Total	12	13		18	7		13	12		8	1					1	1	1			1	1	2	4	2	2	1		3	2	1	2		4	1	4	5		2	1	25
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease		2		1	1			2															1			1							1						1		2
3. Other Diseases of Kidneys and Adnexa	1	1		2				2														1			1							1							1		2
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	1	3		3	1			1														1	1		1	1						1	1						2		4
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other accidents of Pregnancy, sudden death		2			2			2										1				1								1		1									2
4. Puerperal Disease of the Breast																																									
Total		2			2			2										1				1								1		1									2

ST. THOMAS.—*Concluded*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Disease of Bones and Joints																																									
3. Amputation (for unspecified disease)																																									
Total																																									
XI. MALFORMATIONS, ETC																																									
1 Still Births	4	3		7			7			7																			1	2		1	1	1			1				7
2 Congenital Debility and Malformations	8	1		9			9			9																			1	1	1	1	1			1	2	1			9
3 Other Diseases of Infancy	1			1			1			1																							1								1
4 Senile Decay	3	14		6	11		1	16																	2	5	10			3	4	1	4		1		2	1	1		17
Total	16	18		23	11		18	16		17															2	5	10		2	6	5	3	7	1	1	1	5	2	1		31
XII. SUICIDE																																									
1. Poison																																									
2 Strangulation																																									
3 Gas Poisoning																																									
4 Drowning																																									
5 Firearms																																									
Total																																									
XIII ACCIDENT																																									
1 Fractures and Dislocations																																									
2 Gunshot																																									
3 Lightning																																									
4 Drowning	1			1			1											1																		1					1
5 Electric Cars	1			1			1								1																				1						1
6 Bicycles																																									
7 Railways	3			2	1			3												1		1	1						1	1				1							3
8 Burns and Scalds																																									
9. Homicide																																									
10 Other Accidents	7	1		6	2		4	4		1								2		1					1	1	1	1	2	1						1	1		2	1	8
Total	12	1		10	3		6	7		1					1			3		2		1	1		1	1	1	1	3	2				1	1	2	1		2	1	13
XIV. ILL-DEFINED CAUSES																																									
1. Dropsy	1	2			3			3																1		1	1		1	1		1									3
2. Tumors		2		2				2													1	1							1				1								2
3 Other Ill-Defined Causes		1		1				1													1																	1			1
4 Heart Failure	2	1		3			1	2											1	1	1									1				1	1						3
Total	3	6		6	3		1	8											1	1	3	1		1		1	1		2	2		1	1	1	1			1			9
Total from all causes.	90	83		125	47	1	80	92	1	36	1	1	1	2	5	2	6	7	7	10	8	7	9	13	20	19	17	2	17	19	12	15	16	20	7	12	16	11	17	11	173

CAUSES OF DEATHS BY CITIES IN 1904.—GUELPH.

General Diseases.	Sex.			Nativity.			Social Condition.			Ages. Under 5.					Ages.														Months.												
	Male.	Female	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0.1	1	2	3	4.	5–9	10–14	15–19.	20–24	25–29.	30–34	35–39	40–44	45–49	50–59.	60–69	70–79	80 and over	Not given	January.	February.	March.	April.	May.	June.	July.	August.	September	October.	November	December.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	1			1			1											1																			1				1
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough	3	1		4			3	1			1				1	1					1								1						1			1	1		4
6. Diphtheria and Croup		3		2	1		1	2		1																1	1		2	1											3
7. Influenza																																									
8. Other Epidemic Diseases																																									
Total	4	4		7	1		5	3		1	1				1	1		1			1					1	1		3	1					1		1	1	1		8
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1			1			1					1																			1										1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	5	3		7	1		7	1			1				1			3	1				1	1					2	2		1		1				2			8
4. Syphilis																																									
5. Cancer	3	7		3	7		1	9																3	4	2	1		2	1	1			2			2	2			10
6. Rheumatism and Gout																																									
7. Diabetes		1		1			1						1																				1								1
8. Other General Diseases	2	3		5			2	3											3					1		1				1	1	2				1					5
9. Alcoholism, Acute and Chronic																																									
Total	11	14		17	8		13	12			1	1	1		1			3	4				1	5	4	3	1		4	4	3	3	1	3		1	2	4			25
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	2			2			1	1						1										1								1		1							2
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	6	5		4	7		4	7											1	1		1		2	1	4	1			2		3		1	1		1	2		1	11
5. Softening of the Brain																																									
6. Paralysis without specified cause	4	4		4	4			8												1	1				2	4				1		1	2			2		1	1		8
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	4	2		6			6			6																				1					4	1					6
10. Other Nervous Diseases		1			1			1																	1						1										1
Total	16	12		16	12		11	17		6				1					1	2	1	1		3	4	8	1			4	1	5	2	2	5	3	1	3	1	1	28

IV.—CIRCULATORY SYSTEM																																						
1. Pericarditis																																						
2. Endocarditis	1	1		2			1	1						1	1												1									1		2
3. Organic Heart Diseases	8	7		8	7		5	10					1			1		2		1	1	3	5	1		1	1	2	1	2		2	2		2		2	15
4. Angina Pectoris	1	1		1	1			2													1	1					1				1							2
5. Arteries, Atheroma, Aneurism, etc																																						
6. Other Diseases of Circulatory System																																						
Total	10	9		11	8		6	13					1	1	1	1		2		1	2	4	5	1		1	3	2	1	2	1	2	2		2	1	2	19
V. RESPIRATORY SYSTEM.																																						
1. Acute Bronchitis		2			2			2															1	1						1							1	2
2. Chronic Bronchitis		1			1			1															1				1											1
3. Broncho-pneumonia	2	3		2	3		2	3			1			1									2	1			2		1	1				1				5
4. Pneumonia	2	1		3			1	2									1				1		1						1	1				1				3
5. Pleurisy	2			1	1			2										1				1						1									1	2
6. Congestion of the Lungs, including pul. apop.	3			1	2		1	2								1					1	1					1				1	1						3
7. Asthma and Emphysema																																						
8. Other Diseases of Respiratory System																																						
Total	9	7		7	9		4	12			1			1		1	1	1			2	2	5	2			4	1	2	3	1	1		2			2	16
VI. DIGESTIVE SYSTEM.																																						
1. Ulcer of the Stomach																																						
2. Other Diseases of Stomach (cancer excepted)																																						
3. Infantile Diarrhoea and Cholera Infantum	5	3		8			8			8																						1	4	2	1			8
4. Diarrhoea and Enteritis (not infantile)		1			1			1														1				1												1
5. Dysentery																																						
6. Hernia and Intestinal obstructions	1	1		1	1			2									1						1					1	1									2
7. Other Diseases of the Intestines																																						
8. Diseases of the Liver																																						
9. Peritonitis (not puerperal)	1	1		1	1			2								1					1										1				1			2
10. Iliac Abscess and Appendicitis		1		1				1							1																		1					1
Total	7	7		11	3		8	6		8					1	1	1				1	1	1			1		1	1		1	1	5	2	2			14
VII. GENITO-URINARY SYSTEM.																																						
1. Acute Nephritis	2	1		1	2		2	1													1		1	1					2				1					3
2. Bright's Disease	1	2		1	2			3								1					1		1					1				1					1	3
3. Other Diseases of Kidneys and Adnexa																																						
4. Vesical Calculi																																						
5. Diseases of the Bladder	2			1	1			2															1	1		1		1										2
6. Diseases of the Male Genital Organs																																						
7. Metritis																																						
8. Other Diseases of the Uterus																																						
9. Ovarian Cysts and other Ovarian Tumors																																						
10. Other Diseases of the Female Genital Organs																																						
Total	5	3		3	5		2	6								1					2		3	2		1		2	2			1	1				1	8
VIII. PUERPERAL DISEASES.																																						
1. Peurperal Septicaemia																																						
2. Puerperal Albuminuria and Convulsions																																						
3. Other Accidents of Pregnancy, sudden death																																						
4. Puerperal Disease of the Breast																																						
Total																																						

GUELPH.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IX. THE SKIN																				
1. Erysipelas																				
2. Skin and Adnexa (cancer excepted)																				
Total																				
X. LOCOMOTOR SYSTEM																				
1. Pott's Disease																				
2. Diseases of Bones and Joints																				
3. Amputation (for unspecified diseases)																				
Total																				
XI. MALFORMATIONS, ETC.																				
1. Still Births	3	8		11			11			11										
2. Congen. Debility and Malformation	8	7		15			15			15										
3. Other Diseases of Infancy																				
4. Senile Decay	5	10		1	14		1	14												
Total	16	25		27	14		27	14		26										
XII. SUICIDE																				
1. Poison																				
2. Strangulation																				
3. Gas Poisoning																				
4. Drowning																				
5. Firearms																				
6. Not stated																				
Total																				
XIII. ACCIDENT																				
1. Fractures and Dislocations																				
2. Gunshot																				
3. Lightning																				
4. Drowning	3			3			2	1										2	1	
5. Electric Cars																				
6. Railways	1				1		1												1	
7. Burns and Scalds																				
8. Other Accidents	1	1		1	1		2													
9. Asphyxiation	1			1			1											1		
Total	6	1		5	2		6	1										3	2	
XIV. ILL-DEFINED CAUSES.																				
1. Dropsy																				
2. Tumors	2			1	1		1	1										1		
3. Other Ill-Defined Causes	1			1				1												
Total	3			2	1		1	2										1		
Total from all causes	87	82	.	106	63	.	83	86	..	41	3	1	1	1	2	2	2	10	11	4

Number of Column.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN																					
1. Erysipelas																					
2. Skin and Adnexa (cancer excepted)																					
Total																					
X. LOCOMOTOR SYSTEM																					
1. Pott's Disease																					
2. Diseases of Bones and Joints																					
3. Amputation (for unspecified diseases)																					
Total																					
XI. MALFORMATIONS, ETC.																					
1. Still Births									2		2			2	2	1	1		1		11
2. Congen. Debility and Malformation											1	3	2		2	2	1	1	2	1	15
3. Other Diseases of Infancy																					
4. Senile Decay					1	2	12		2	2			2		1	1	1	1	2	3	15
Total					1	2	12		4	2	3	3	4	2	5	4	3	2	5	4	41
XII. SUICIDE																					
1. Poison																					
2. Strangulation																					
3. Gas Poisoning																					
4. Drowning																					
5. Firearms																					
6. Not stated																					
Total																					
XIII. ACCIDENT																					
1. Fractures and Dislocations																					
2. Gunshot																					
3. Lightning																					
4. Drowning													2						1		3
5. Electric Cars																					
6. Railways														1							1
7. Burns and Scalds																					
8. Other Accidents	1			1								1							1		2
9. Asphyxiation																	1				1
Total	1			1								1	2	1			1		2		7
XIV. ILL-DEFINED CAUSES.																					
1. Dropsy																					
2. Tumors					1				1										1		2
3. Other Ill-Defined Causes					1										1						1
Total					2				1						1				1		3
Total from all causes	6	1	2	16	18	28	20	..	15	18	13	18	14	11	17	16	12	14	11	10	169

CAUSES OF DEATHS BY CITIES IN 1904.—ST. CATHARINES.

General Diseases.	Sex.			Nativity.			Soc'l con.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0	1	2	3	4	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over	Not given.	January.	February	March	April.	May.	June.	July.	August	September.	October	November	December.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES																																									
1. Typhoid Fever	5	3		7	1		4	4									1	2	1	2	1			1					1	1	1		1	1	1			1		1	8
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	2	1		3			3								2	1																							1	2	3
7. Influenza																																									
8. Other Epidemic Diseases																																									
Total	7	4		10	1		7	4							2	1	1	2	1	2	1			1					1	1	1		1	1	1			1	1	3	11
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia	3			2	1		1	2							1							1	1													1	1	1			3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	13	9		16	6		13	9			1				2	1	2	3	1	1	2	2		4	2	1			1	2	1		5	3	5	1	2		2		22
4. Syphilis																																									
5. Cancer	5	5		3	7		1	8	1											1				3	2	3	1		1	1		1	2		1		1	2		1	10
6. Rheumatism and Gout																																									
7. Diabetes	1	1		1	1			2																	1	1					1			1							2
8. Other General Diseases	1	3		4			1	3									1		1		1		1										2		1					1	4
9. Alcoholism, Acute and Chronic																																									
Total	23	18		26	15		16	24	1		1				3	1	3	3	2	2	3	3	2	7	5	5	1		2	3	2	1	9	4	7	2	4	3	2	2	41
Local Diseases.																																									
III. DISEASES OF NERVOUS SYSTEM																																									
1. Encephalitis		1		1			1											1													1										1
2. Simple Meningitis																																									
3. Epidemic Cerebro-spinal Meningitis	1	1		2			2			1					1																		1					1			2
4. Congestion and Hemorrhage of Brain	2	2		2	2			4																	1	2	1										1	2		1	4
5. Softening of the Brain																																									
6. Paralysis without specified cause	4	2		1	5		1	5															1		1	4			1		2		1			1	1				6
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	2	3		5			5			3	1		1																			1	1	1	2						5
10. Other Nervous Diseases	1	1			2			2																	2						1	1									2
Total	10	10		11	9		9	11		4	1		1		1			1					1		4	6	1		1		4	2	3	1	2	1	2	3		1	20

ST. CATHARINES.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis		1		1				1																	1						1										1
3. Organic Heart Disease	10	10		14	6		4	16													1	1	1	6	6	5			2	1		5	1	4			1	1	1	4	20
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.	1				1			1																		1					1										1
6. Other Diseases of the Circulatory System																																									
Total	11	11		15	7		4	18													1	1	1	6	7	6			2	1	2	5	1	4			1	1	1	4	22
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	2	2		3	1		2	2		1															1	2			2	1					1						4
2. Chronic Bronchitis		1			1			1																		1													1		1
3. Broncho-pneumonia																																									
4. Pneumonia	4	5		5	4		5	4									1	1	1	1	1	1			1	2			1	5	1		1							1	9
5. Pleurisy	2	1		3			2	1			1													2							1	1		1							3
6. Congestion of the Lungs, inc. pul. apoplexy	1	2		1	2		1	2		1													1				1				1		1							1	3
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	9	11		12	8		10	10		2	1						1	1	1	1	1	1	1	2	2	5	1		3	6	3	1	2	1	1				1	2	20
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	1				1			1															1															1			1
3. Infantile Diarrhœa and Cholera Infantum	4	4		8			8			7	1																								1	2	5				8
4. Diarrhœa and Enteritis (not infantile)	2	1		3				3																1	2				1											2	3
5. Dysentery																																									
6. Hernia and Intestinal obstructions		1			1			1																		1									1						1
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	1	1		2				2																	2								2								2
9. Peritonitis (not puerperal)	1	1		2			1	1						1						1																	1			1	2
10. Iliac Abscess and Appendicitis	1			1				1											1																	1					1
Total	10	8		16	2		9	9		7	1			1					1	1			1	1	4	1			1				2		2	3	6	1		3	18
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	3	3		2	4		2	4										1		2				1	1	1					2	1		1	1			1			6
3. Other Diseases of Kidneys and Adnexa	1				1			1																	1								1								
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs	1				1			1																		1							1								1
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		1		1			1																		1														1		1
10. Other Diseases of the Female Genital Organs																																									
Total	5	4		3	6		3	6										1		2				1	3	2					2	1	2	1	1			1	1		9

VIII. PUERPERAL DISEASES.																																						
1. Puerperal Septicaemia																																						
2. Puerperal Albuminuria and Convulsions																																						
3. Other accidents of Pregnancy sudden death		2	1	1		2													1	1										1			1					2
4. Puerperal Disease of the Breast																																						
Total		2	1	1		2													1	1										1			1					2
IX. THE SKIN																																						
1. Erysipelas																																						
2. Skin and Adnexa (cancer excepted)																																						
X. LOCOMOTOR SYSTEM. Total																																						
1. Pott's Disease																																						
2. Diseases of Bones and Joints																																						
3. Amputation (for unspecified Disease)																																						
XI. MALFORMATIONS, ETC. Total																																						
1. Still-Births	7	5	12		12			12																		1			1	4	1	2	1	1			1	12
2. Congenital Debility and Malformations	11	5	16		16			16																		1		2		4			3	3		2	1	16
3. Other Diseases of Infancy																																						
4. Senile Decay	7	6	3	10	2	11																		5	8	1		1		4			1	1	2	2	1	13
Total	25	16	31	10	30	11		28																5	8	3		3	1	12	1	2	5	5	2	4	3	41
XII. SUICIDE.																																						
1. Poison																																						
2. Strangulation																																						
3. Gas Poisoning																																						
4. Drowning																																						
5. Firearms																																						
6. Not stated																																						
Total																																						
XIII. ACCIDENT.																																						
1. Fractures and Dislocations	2			2		2																		1	1										1	1		2
2. Gunshot																																						
3. Lightning																																						
4. Drowning	2	1	2	1	3					1					1								1									1		2				3
5. Electric Cars																																						
6. Bicycles																																						
7. Railways																																						
8. Burns and Scalds	1	3	4		3	1				1					1							2					1		1		1					1		4
9. Homicide																																						
10. Poisoning	1	1	1	1		2															2					2												2
Total	6	5	7	4	6	5				2					2						2	2	1	1	1	2	1		1		1	1		2	1	2		11
XIV. ILL DEFINED CAUSES.																																						
1. Tetanus		1		1		1													1																1			1
2. Tumors	1		1			1														1						1												1
3. Other Ill defined Causes	1			1		1																	1														1	1
4. Heart Failure		1	1			1																1															1	1
Total	2	2	2	2		4													1	1		1	1			1									1		2	4
Total from all causes	108	91	134	65	94	104	1	41	4	2	1	1	6	2	7	8	5	8	8	7	8	21	27	31	12	16	12	17	12	33	14	17	12	20	14	12	20	199

CAUSES OF DEATHS BY CITIES, IN 1904.—BELLEVILLE.

General Diseases.	Sex. Male.	Female.	Not stated.	Nativity. Canada.	Foreign.	Not stated.	Social Con. Single.	Married.	Not stated.
Number of Column	1	2	3	4	5	6	7	8	9
I. COMMUNICABLE DISEASES.									
1. Typhoid Fever	1					1		1	
2. Smallpox									
3. Measles									
4. Scarlet Fever									
5. Whooping Cough									
6. Diphtheria and Croup	2	1		3			3		
7. Influenza	1			1				1	
8. Other Epidemic Diseases									
Total	4	1		4		1	3	2	
II. OTHER GENERAL DISEASES.									
1. Pyaemia and Septicaemia		1		1				1	
2. Malarial Fever									
3. Tuberculosis and Scrofula	8	5		9	2	2	5	8	
4. Syphilis									
5. Cancer	3	3		2	4		1	4	1
6. Rheumatism and Gout		1		1				1	
7. Diabetes	2	1		2	1			2	1
8. Other General Diseases	1	1		2			1	1	
9. Alcoholism, Acute and Chronic									
Total	14	12		17	7	2	5	17	4
Local Diseases.									
III. NERVOUS SYSTEM.									
1. Encephalitis									
2. Simple Meningitis	2			2			2		
3. Epidemic Cerebro spinal Meningitis									
4. Congestion and Hemorrhage of Brain	7	6		6	6	1	2	10	1
5. Softening of the Brain	1			1				1	
6. Paralysis without specified cause	1	1			2			2	
7. Insanity									
8. Epilepsy									
9. Convulsions (not puerperal)	4			4			4		
10. Other Nervous Diseases									
Total	15	7		13	8	1	8	13	1

General Diseases.	Ages. Under 5: 0	1	2	3	4	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over	Not given
Number of Column	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
I. COMMUNICABLE DISEASES.																			
1. Typhoid Fever															1				
2. Smallpox																			
3. Measles																			
4. Scarlet Fever																			
5. Whooping Cough																			
6. Diphtheria and Croup						2	1												
7. Influenza													1						
8. Other Epidemic Diseases																			
Total						2	1						1		1				
II. OTHER GENERAL DISEASES.																			
1. Pyaemia and Septicaemia										1									
2. Malarial Fever																			
3. Tuberculosis and Scrofula									1	2	1	1	3		2	1	1		1
4. Syphilis																			
5. Cancer															2	2	1	1	
6. Rheumatism and Gout															1				
7. Diabetes															1	1	1		
8. Other General Diseases								1							1				
9. Alcoholism, Acute and Chronic																			
Total								1	1	3	1	1	3		7	4	3	1	1
Local Diseases.																			
III. NERVOUS SYSTEM.																			
1. Encephalitis																			
2. Simple Meningitis	1							1											
3. Epidemic Cerebro spinal Meningitis																			
4. Congestion and Hemorrhage of Brain															2	3	6		2
5. Softening of the Brain																	1		
6. Paralysis without specified cause																	1	1	
7. Insanity																			
8. Epilepsy																			
9. Convulsions (not puerperal)	4																		
10. Other Nervous Diseases																			
Total	5							1							2	3	8	1	2

General Diseases.	Months. Jan.	Feb.	March	April	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Number of Column	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.													
1. Typhoid Fever					1								1
2. Smallpox													
3. Measles													
4. Scarlet Fever													
5. Whooping Cough													
6. Diphtheria and Croup											1	2	3
7. Influenza									1				1
8. Other Epidemic Diseases													
Total					1				1		1	2	5
II. OTHER GENERAL DISEASES.													
1. Pyaemia and Septicaemia								1					1
2. Malarial Fever													
3. Tuberculosis and Scrofula	2			1	1	1	3	1		1		3	13
4. Syphilis													
5. Cancer				1		1		3	1				6
6. Rheumatism and Gout							1						1
7. Diabetes				1				1			1		3
8. Other General Diseases			1					1					2
9. Alcoholism, Acute and Chronic													
Total	2		1	3	1	2	4	7	1	1	1	3	26
Local Diseases.													
III. NERVOUS SYSTEM.													
1. Encephalitis													
2. Simple Meningitis			2										2
3. Epidemic Cerebro spinal Meningitis													
4. Congestion and Hemorrhage of Brain	3	1	1	1				1	2	2	2		13
5. Softening of the Brain	1												1
6. Paralysis without specified cause					1		1						2
7. Insanity													
8. Epilepsy													
9. Convulsions (not puerperal)		1			1	1	1						4
10. Other Nervous Diseases													
Total	4	2	3	1	2	1	2	1	2	2	2		22

Disease	Figures (in printed order)	Total
IV. DISEASES OF CIRCULATORY SYSTEM.		
1. Pericarditis	...	...
2. Endocarditis	1 1 1 1	1
3. Organic Heart Diseases	8 8 7 9 3 1 3 3 7 3 2 2 2 1 3 2 1 2 1	16
4. Angina Pectoris	1 1 1 1 1	1
5. Arteries, Atheroma, Aneurism, etc.	...	...
6. Other Diseases of Circulatory System	...	...
Total	10 8 9 9 3 15 1 3 3 8 3 2 2 2 1 3 2 1 2 3	18
V. RESPIRATORY SYSTEM.		
1. Acute Bronchitis	...	...
2. Chronic Bronchitis	1 1 1 1 1	1
3. Broncho-pneumonia	...	...
4. Pneumonia	16 11 18 9 3 7 21 2 3 2 1 1 1 1 1 6 6 2 6 2 6 6 3 2 3 2 1 1 2 2	30
5. Pleurisy	...	...
6. Congestion of the Lungs, inc. pul. apop.	2 1 1 1 1 1 1 1 1	2
7. Asthma and Emphysema	...	...
8. Other Diseases of Respiratory System	...	...
Total	19 14 20 10 [illegible] 8 21 4 3 2 1 1 1 1 1 1 6 8 2 6 2 6 6 3 2 3 [illegible] 2 1 4 2	33
VI. DIGESTIVE SYSTEM.		
1. Ulcer of the Stomach	...	...
2. Other Diseases of Stomach (cancer excepted)	2 1 1 2 1 1 1 1	2
3. Infant. Diarrhoea and Cholera Infantum	2 3 5 5 1 1 1 1 1 1 1	5
4. Diarrhoea and Enteritis (not infantile)	1 2 1 2 1 1 1 1 1 1 1	3
5. Dysentery	...	...
6. Hernia and Intestinal obstructions	...	...
7. Other Diseases of the Intestines	...	...
8. Diseases of the Liver	1 1 1 1 2 1 1 1 1	2
9. Peritonitis (not Puerperal)	...	...
10. Iliac Abscess and Appendicitis	...	...
Total	4 8 8 1 6 6 4 1 1 1 2 1 2 1 2 1 1 1 2 2 1 1	12
VII. GENITO-URINARY SYSTEM.		
1. Acute Nephritis	2 1 1 1 1 1 1 2	2
2. Bright's Disease	1 3 1 1 2 1 1 1 1 1 1 1 1 1	4
3. Other Diseases of Kidneys and Adnexa	1 1 1 1 1	1
4. Vesical Calculi	...	...
5. Diseases of the Bladder	2 1 1 2 2 1 1	2
6. Diseases of the Male Genital Organs	...	...
7. Metritis	...	...
8. Other Diseases of the Uterus	...	...
9. Ovarian Cysts and other Ovarian Tumors	...	...
10. Other Diseases of Female Genital Organs	...	...
Total	4 [illegible] 7 2 1 6 2 1 1 2 1 4 2 2 1 1 1 2	9
VIII. PUERPERAL DISEASES.		
1. Puerperal Septicaemia	...	...
2. Puerperal Albuminuria and Convulsions	...	...
3. Other accidents of Preg. (sudden death)	1 1 1 1 1	1
4. Puerperal Disease of the Breast	...	...
Total	1 1 1 1 1	1

BELLEVILLE.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1	1		1	1			2													1				1							1								1	2
2. Skin and Adnexa (cancer excepted)																																									
Total	1	1		1	1			2													1				1							1								1	2
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	2	2		4			1			4																			1									3			4
2. Congen. Debil. and Malformations	6	2		8			8			8																			2	2		1	1				1			1	8
3. Other Diseases of Infancy																																									
4. Senile Decay	11	8		7	12		2	15	2																	12	7		1	1		1	3	1	3		3	3	1	2	19
Total	19	12		19	12		11	15	2	12																12	7		4	3		2	4	1	3		4	6	1	3	31
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	2	2		3		1	2	1	1														1	1		1	1		1		1	1								1	4
2. Gunshot		1		1			1											1																	1						1
3. Lightning																																									
4. Drowning	2			1	1			1	1											1					1										1			1			2
5. Electric Cars																																									
6. Bicycles																																									
7. Railways																																									
8. Burns and Scalds																																									
9. Homicide																																									
10. Other accidents	3			2		1	3									1		1			1								1	1									1		3
Total	7	3		7	1	2	6	2	2							1		2		1	1		1	1	1	1	1		2	1	1	1			2			1	1	1	10
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy		2		2				2																			2			1							1				2
2. Tumors																																									
3. Other ill-defined causes	1				1			1																		1				1											1
4. Heart Failure		1			1			1																1										1							1
Total	1	3		2	2			4																1		1	2			2				1			1				4
Total from all causes	98	75		108	56	9	54	104	15	24	3				2	3	3	6	6	3	4	4	3	23	23	40	23	3	15	16	13	16	15	9	18	10	16	15	12	18	173

CAUSES OF DEATHS BY CITIES IN 1904.—STRATFORD.

General Diseases.	Sex.			Nativity.			Social Condition.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0.1	1.	2.	3.	4.	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	2	3		5			1	1											1		3	1							1			1		1		1	1				5
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever		1		1			1					1																									1				1
5. Whooping Cough	1	2		3			3			3																					1		2								3
6. Diphtheria and Croup																																									
7. Influenza																																									
8. Other Epidemic Diseases																																									
Total	3	6		9			5	1		3		1							1		3	1							1		1	1	2	1		1	2				9
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia		1			1			1																		1													1		1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	6	7		7	6		5	8										1	2	2		1	1	3	1	2			1	2	1		1	1	2	1		1	3		13
4. Syphilis																																									
5. Cancer	1	3		1	3		1	3											1					1	2					1		1					1		1		4
6. Rheumatism and Gout																																									
7. Diabetes	1			1				1														1								1											1
8. Other General Diseases		3		2	1			3										1					1	1						1	1								1		3
9. Alcoholism, Acute and Chronic																																									
Total	8	14		11	11		6	16										2	3	2		2	2	5	3	3			1	5	2	1	1	1	2	1	1	1	6		22
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	4	2		5		1	5		1	4									1					1							1		1	3					1		6
3. Epidemic Cerebro-spinal Meningitis	1			1			1			1																								1							1
4. Congestion and Hemorrhage of the Brain	1	3		1	3			4																2		1	1			2			1						1		4
5. Softening of the Brain	1				1			1																			1		1												1
6. Paralysis without specified cause	4	1		1	4		1	4										1							2	2			1						2	1	1				5
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)																																									
10. Other Nervous Diseases		1		1				1												1																	1				1
Total	11	7		9	8	1	7	10	1	5								1	1	1				3	2	3	2		2	2	1		2	4	2	1	2		2		18

STRATFORD.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	4	2		3	3		1	4	1										3							1	2			1	2	1	1							1	6
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System																																									
Total	4	5		3	3		1	4	1										3							1	2			1	2	1	1							1	6
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis		1			1			1																			1				1										1
2. Chronic Bronchitis																																									
3. Broncho-pneumonia		2		1	1		1	1		1																	1			1	1										2
4. Pneumonia	2	2		3		1	2	1	1	1	1															1	1		2			1	1								4
5. Pleurisy																																									
6. Congestion of the Lungs																																									
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	2	5		4	2	1	3	3	1	2	1															1	3		2	1	2	1	1								7
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach		1		1			1										1																		1						1
2. Other Diseases of Stomach (cancer excepted)																																									
3. Infantile Diarrhœa and Cholera Infantum	3			3			3			3																									1	1	1				3
4. Diarrhœa and Enteritis (not infantile)	1	1		2			2															2										1				1					2
5. Dysentery																																									
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver		1		1				1												1																			1		1
9. Peritonitis (not puerperal)		3		1	2			3											1				1			1			1		1		1								3
10. Iliac Abscess and Appendicitis		1		1			1											1														1									1
Total	1	7		9	2		7	4		3							1	1	1	1		2	1			1			1		1	2	1		2	2	1		1		11
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	1	2		4	2		3	3		1									1					1		2	1		1				2				2	1			6
3. Other Diseases of Kidneys and Adnexa	1				1			1																1								1									1
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of Female Genital Organs																																									
Total	5	2		4	3		3	4		1									1					2		2	1		1			1	2				2	1			7

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other accidents of Pregnancy, sudden death																																									
4. Puerperal Disease of the Breast																																									
Total																																									
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC																																									
1. Still-births	1			1			1			1																											1				1
2. Congen. Debility and Malformations	4	3		7			7			7																			1	1			1	1		1	1	1			7
3. Other Diseases of Infancy		1		1			1			1																								1							1
4. Senile decay	12	5			17		2	14	1																	6	11		3	3	1	1	1	3		1	2	1		1	17
Total	17	9		9	17		11	14	1	9																6	11		4	4	1	1	2	5		2	4	2		1	26
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	1			1			1													1																	1				1
2. Gunshot																																									
3. Lightning																																									
4. Drowning	1				1			1											1																	1					1
5. Electric Cars																																									
6. Bicycles																																									
7. Railways																																									
8. Burns and Scalds	1			1			1				1																											1			1
9. Homicide																																									
10. Other accidents	2			2			2											1		1												1							1		2
Total	5			4	1		4	1			1							1	1	2												1				1	1	1	1		5
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	1				1		1																				1									1					1
2. Tumors																																									
3. Other Ill-defined Causes		2		2				2												1		1									2										2
4. Heart Failure		2		2				2											1					1										2							2
Total	1	4		4	1		1	4											1	1		1		1			1				2			2		1					5
Total from all causes	60	56	.	66	48	2	48	64	4	23	2	1					1	5	12	7	3	6	3	11	5	17	20	.	12	13	12	9	12	13	6	9	13	5	10	2	116

CAUSES OF DEATHS BY CITIES IN 1904.—WINDSOR.

General Diseases.	Sex			Nativity.			Social con.			Ages: Under 5.																			Months												
	Male	Female	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married	Not stated.	0	1	2	3	4	5-9.	10-14	15-19	20-24	25-29	30-34.	35-39.	40-44	45-49	50-59	60-69	70-79.	80 & over.	Not given.	Jan	Feb.	March.	April	May.	June	July	Aug.	Sept	Oct	Nov	Dec	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	3	5		5	3		5	3								1	1	1	1	1	1	2							1	1	1	1				2		2			8
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	2	2		4			4			3								1											1	1		1		1							4
7. Influenza		4			4		1	3														1				1	2		1	2	1										4
8. Other Epidemic Diseases																																									
Total	5	11		9	7		10	6		3						1	1	2	1	1	1	3				1	2		3	4	2	2		1		2		2			16
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia																																									
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	13	6		11	7	1	11	8				1		1	1	2	3	2		3		1	2	1		2				2	4	4		3	2	1		1		2	19
4. Syphilis																																									
5. Cancer	3	6		5	4			9											1	3	1			2	1	1			1				2		1	2		3			9
6. Rheumatism and Gout																																									
7. Diabetes																																									
8. Other General Diseases	1				1			1																		1				1											1
9. Alcoholism, Acute and Chronic																																									
Total	17	12		16	12	1	11	18				1		1	1	2	3	2	1	6	1	1	2	3	1	4			1	3	4	4	2	3	3	3		4		2	29
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	2	3		5			5			1	1		1		1		1																	1	1	1	1			1	5
3. Epidemic Cerebro-spinal Meningitis		1		1			1			1																												1			1
4. Congestion and Hemorrhage of Brain	3	4		2	5			7																1	2	4			1			1	1			1			1	2	7
5. Softening of the Brain	2			1	1			2															1			1					1					1					2
6. Paralysis without specified cause	2			1	1			2																1	1									1					1		2
7. Insanity																																									
8. Epilepsy		1		1			1												1										1												1
9. Convulsions (not puerperal)	2	1		3			3			3																											1	1		1	3
10. Other Nervous Diseases		1		1			1					1																					1								1
Total	11	11		15	7		11	11		5	1	1	1		1		1		1				1	2	3	5			2		1	1	2	2	1	3	2	2	2	4	22

IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis	1			1			1									1																		1							1
2. Endocarditis																																									
3. Organic Heart Diseases	5	8		8	5		2	11									1					1	2	2	1	6			1		4				2		2	1		3	13
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.		1			1			1																			1											1			1
6. Other Diseases of the Circulatory System																																									
Total	6	9		9	6		3	12								1	1					1	2	2	1	6	1		1		4			1	2		2	2		3	15
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	2	2		3	1		2	2		1			1													1	1		2	1		1									4
2. Chronic Bronchitis																																									
3. Broncho-pneumonia	4	3		4	3		5	2		1	2	1				1					1						1		1		1	1	3	1							7
4. Pneumonia	4	5		7	2		6	3		3	1					1						1		1	1	1				1	1	3	1	2		1					9
5. Pleurisy		1		1				1																		1													1		1
6. Congestion of the Lungs, inc. pul. apoplexy	1			1			1				1																						1								1
7. Asthma and Emphysema		1			1			1																1							1										1
8. Other Diseases of the Respiratory System																																									
Total	11	12		16	7		14	9		5	4	1	1			2					1	1		2	1	3	2		3	2	3	5	5	3		1			1		23
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)		1		1				1												1																		1			1
3. Infantile Diarrhoea and Cholera Infantum	3	5		7	1		8			8																								1	1	3	1	1		1	8
4. Diarrhoea and Enteritis (not infantile)	1	3		1	2	1	1	3					1												1	2										4					4
5. Dysentery																																									
6. Hernia and Intestinal obstructions		2			2			2																	1	1												2			2
7. Other Diseases of the Intestines	1			1				1												1														1							1
8. Diseases of the Liver	1	2		2	1			3															1			1	1								1		2				3
9. Peritonitis (not puerperal)	1				1			1																	1									1							1
10. Iliac Abscess and Appendicitis																																									
Total	7	13		12	7	1	9	11		8			1						1	1		1		3	1	1								2	5	1	8	1	1	1	20
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	2	3		2	3			5												1		1				3						1					1		2	1	5
3. Other Diseases of Kidneys and Adnexa																																									
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		1		1				1														1																		1	1
10. Other Diseases of the Female Genital Organs																																									
Total	2	4		3	3			6												1		2				3						1					1		2	2	6
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other Accidents of Pregnancy, sudden death		1		1				1														1												1							1
4. Puerperal Disease of the Breast																																									
Total		1		1				1														1												1							1

WINDSOR. *Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas	1				1			1																		1					1										1
2. Skin and Adnexa (cancer excepted)																																									
Total	1				1			1																		1					1										1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	2	9		11			11			11																			1			1		2		2			2	3	11
2. Congen. Debility and Malformations	12	7		19			19			19																			1		1		3	2		3	3	3		3	19
3. Other Diseases of Infancy																																									
4. Senile Decay	11	4		5	9	1		15																		4	11		3		4		1	1	2	2	1			1	15
Total	25	20		35	9	1	30	15		30																4	11		5		5	1	4	5	2	7	4	3	2	7	45
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Not specified																																									
Total																																									
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lightning																																									
4. Drowning																																									
5. Electric Cars																																									
6. Suffocation																																									
7. Railways	2	1		1	2		1	2										1	1		1												1						1	1	3
8. Burns and Scalds																																									
9. Homicide		1		1				1																		1						1									1
10. Other Accidents	1			1				1												1												1									1
11. Poison																																									
Total	3	2		3	2		1	4										1	1	1	1					1						2	1						1	1	5
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy		1			1			1																	1								1								1
2. Tumors		2		1	1		1	1																	1		1				1			1							2
3. Other Ill-Defined Causes	2	1		2	1		1	2											1		1					1									1	1			1		3
4. Heart Failure	3	3		4	2		1	5										1	1	1		1	1	1						1		1			1	2			1		6
Total	5	7		7	5		3	9										1	2	1	1	1	1	1	2	1	1			1	1	1	1	1	2	3			2		12
Total from all causes	93	102	..	126	66	3	92	103	..	51	5	3	3	1	2	6	6	6	8	10	8	8	6	13	15	27	17		15	10	22	16	18	19	11	28	9	19	10	18	195

CAUSES OF DEATHS BY CITIES IN 1904.—CHATHAM.

General Diseases.	Sex.			Nativity.			Social Con.			Ages. Under 5.																		Months												
	Male.	Female.	Not stated.	Canadian	Foreign.	Not stated.	Single	Married.	Not stated.	1.0	1	2	3	4	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39	40-44.	45-49.	50-59	60-69	70-79	80 and over.	Not given.	January	February.	March.	April.	May.	June.	July.	August.	September	October.	November	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1 Typhoid Fever	3	4		6	1		2	5			1								1		3	1					1						2			1		1	2	1	7
2. Smallpox																																									
3 Measles																																									
4 Scarlet Fever																																									
5. Whooping Cough																																									
6 Diphtheria and Croup	2	4		6			6			1		1	1		2	1													2				1				1	1		1	6
7. Influenza		2			2			2																			2		1		1										2
8 Other Epidemic Diseases																																									
Total	5	10		12	3		8	7		1	1	1	1		2	1			1		3	1					3		3		1		3			1	1	2	2	2	15
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia		1		1				1															1																	1	1
2 Malarial Fever																																									
3. Tuberculosis and Scrofula	10	7		14	2	1	7	10										7	2			2		4	1		1		3	1	1		2	2	1	1	1	1		4	17
4. Syphilis																																									
5 Cancer	1	4		2	3			5														1		3	1				1			1				1			1	1	5
6. Rheumatism and Gout																																									
7 Diabetes	2	2		2	2			4													1				1	1	1		1	1		1								1	4
8. Other General Diseases	1			1			1												1																					1	1
9. Alcoholism, Acute and Chronic																																									
Total	14	14		20	7	1	8	20										7	3		1	3	1	7	3	1	2		5	2	1	2	2	2	1	2	1	1	1	8	28
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	2			2			2			1		1																				1	1								2
3. Epidemic Cerebro spinal Meningitis																																									
4 Congestion and Hemorrhage of Brain	1			1				1																1														1			1
5. Softening of the Brain	1				1			1																		1			1												1
6 Paralysis without specified cause	3	5		6	2		2	6											1			2			2	3				1	3			1	2					1	8
7. Insanity																																									
8 Epilepsy																																									
9 Convulsions (not puerperal)	1	1		2			2			2																						1		1							2
10. Other Nervous Diseases	2			1	1			2															1			1							1						1		2
Total	10	6		12	4		6	10		3		1							1			2	1	1	2	5			1	1	3	2	2	2	2			1	1	1	16

CHATHAM.—*Continued.*

Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. DISEASES OF CIRCULATORY SYSTEM.																																									
1. Pericarditis		1		1				1										1																1							1
2. Endocarditis																																									
3. Organic Heart Disease	7	3		4	6		1	9											1			1			3	3	2				2	1	2					2	2	1	10
4. Angina Pectoris	1				1			1																	1								1								1
5. Diseases of Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of the Circulatory System																																									
Total	8	4		5	7		1	11										1	1			1			4	3	2				2	1	3	1				2	2	1	12
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	1	2		3			2	1		2														1										1			1			1	3
2. Chronic Bronchitis																																									
3. Broncho pneumonia																																									
4. Pneumonia	7	6		10	2	1	7	6		2	1	1					1	1	1		1	1	1			3			3	2			2	1				2	1	2	13
5. Pleurisy	2	1		2	1		2	1			1								1	1										1		1	1								3
6. Congestion of the Lungs inc. pul. apoplexy																																									
7. Asthma and Emphysema	1				1			1																	1							1									1
8. Other Diseases of Respiratory System																																									
Total	11	9		15	4	1	11	9		4	2	1					1	1	2	1	1	1	1	1	1	3			3	3		2	3	2			1	2	1	3	20
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)		1		1				1																1													1				1
3. Infan. Diarrhœa and Cholera Infantum	2			2			2				2																										1	1			2
4. Diarrhœa and Enteritis (not infantile)																																									
5. Dysentery																																									
6. Hernia and Intestinal obstructions		1		1				1														1																	1		1
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	1	4		2	3		1	4										1						1	1		1	1					1	1	2					1	6
9. Peritonitis (not puerperal)		3		3			2	1								1	1									1			1	1						1					3
10. Iliac Abscess and Appendicitis		1		1			1								1																						1				1
Total	3	10		10	3		6	7			2				1	1	1	1				1		2	1	1	1	1	1	1			1	1	2	1	3	1	1	1	13
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis		1		1				1											1													1									1
2. Bright's Disease	1	2		2	1			3													1					1	1					1								2	3
3. Other Diseases of the Kidneys and Adnexa																																									
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors		1			1			1											1																1						1
10. Other Diseases of the Female Genital Organs																																									
Total	1	4		3	2			5											2		1					1	1					2			1					2	5

VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicaemia		1		1				1													1															1				1
2. Puerperal Albuminaria and Convulsions																																								
3. Other accidents of Pregnancy sudden death																																								
4. Puerperal Diseases of the Breast																																								
Total		1		1				1													1															1				1
IX. OTHER DISEASES OF THE SKIN.																																								
1. Erysipelas																																								
2. Other dis. of Skin & Adnexa (cancer excepted)																																								
Total																																								
X. LOCOMOTOR SYSTEM.																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation (for unspecified Diseases)																																								
Total																																								
XI. MALFORMATIONS, ETC.																																								
1. Still-Births	3	2	1	6			6			6																						1		3		2				6
2. Congenital Debility and Malformations	5	7		12			12			12																					1	2	2		2	1	1	1	2	12
3. Other Diseases of Infancy																																								
4. Senile Decay	5	10		3	12			15																	7	8				1	1			2	1	2	4	1	3	15
Total	13	19	1	21	12		18	15		18															7	8				1	2	3	2	5	3	5	5	2	5	33
XII. SUICIDE.																																								
1. Poison																																								
2. Strangulation																																								
3. Gas Poisoning																																								
4. Drowning																																								
5. Firearms																																								
Total																																								
XIII. ACCIDENTS.																																								
1. Fractures and Dislocations	1			1			1																1																1	1
2. Gunshot																																								
3. Lightning																																								
4. Drowning																																								
5. Electric Cars																																								
6. Bicycles	1			1			1																									1								1
7. Railways																																								
8. Burns and Scalds	1			1				1															1																1	1
9. Homicide																																								
10. Other Accidents	1	1		1	1			2																1	1					2										2
Total	4	1		4	1		2	3							1								2	1	1					2		1							2	5
XIV. ILL-DEFINED CAUSES.																																								
1. Dropsy	1	1		1	1			2															1	1					2											2
2. Tumors	2	1		2	1			3															1	2					1			2								3
3. Other Ill-Defined Causes	1	2		2		1	2	1								1					1						1					1				1			1	3
4. Heart Failure																																								
Total	4	4		5	2	1	2	6								1					1		2	3			1		3			3				1			1	8
Total from all causes	73	82	1	108	45	3	62	94		26	5	3	1	3	3	3	10	10	1	6	11	3	15	15	22	17	2	13	10	10	11	21	10	11	7	13	14	10	26	156

CAUSES OF DEATHS BY CITIES IN 1904.—WOODSTOCK.

General Diseases.	Sex.			Nativity.			Social con.			Ages.																			Months												
										Under 5.																															
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0-1	1	2	3	4	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	1	3		3	1		2	2										1	2	1																	2	2			4
2. Smallpox																																									
3. Measles		1		1			1			1																							1								1
4. Scarlet Fever		2		2			2					1			1														1		1										2
5. Whooping Cough																																									
6. Diphtheria and Croup	1			1			1									1																		1							1
7. Influenza		3		1	2			3																	1		2		1	2											3
8. Other Epidemic Diseases																																									
Total	2	9		8	3		6	5		1		1			1	1		1	2	1					1		2		2	2	1		1	1			2	2			11
II. OTHER GENERAL DISEASES.																																									
1. Pyæmia and Septicæmia	1				1			1																		1						1									1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	8	4		12			3	9										1	2	1	3	2		1	2				1		2	1	3			3		2			12
4. Syphilis																																									
5. Cancer	5	6		5	6		2	9									1					1	2		1	4	2		1	3		2			2			1	2		11
6. Rheumatism and Gout	1			1			1										1																			1					1
7. Diabetes	1	1		1	1		1	1							1											1													1	1	2
8. Other General Diseases	1	1		2			2															1		1								2									2
9. Alcoholism, Acute and Chronic																																									
Total	17	12		21	8		9	20							1		2	1	2	1	3	4	2	2	3	6	2		2	3	2	6	3		2	4		3	3	1	29
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	1			1				1																1								1									1
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	3	3		4	2			6													1			1	1	2	1		1	1	1	2	1								6
5. Softening of the Brain	1			1				1																		1				1											1
6. Paralysis without specified cause		2		1	1			2																1			1		1	1											2
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	3			3			3			3																				1	1		1								3
10. Other Nervous Diseases		1		1			1													1															1						1
Total	8	6		11	3		4	10		3										1	1			3	1	3	2		2	4	2	3	2		1						14

IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	6	13		11	8		7	12								2			1				1	3	4	6	2		1	4	2		1	1		3	2	1	2	2	19
4. Angina Pectoris	2			1	1			1	1														1				1				1					1					2
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System																																									
Total	8	13		12	9		7	13	1							2			1				2	3	4	6	3		1	4	3		1	1		4	2	1	2	2	21
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis																																									
2. Chronic Bronchitis		1		1				1																		1											1				1
3. Broncho-pneumonia	2	1		2	1		1	2		1																2			1		1						1				3
4. Pneumonia	6	8		11	3		3	10	1	1	1										1	1			6	1	3			6	3		2		1				1	1	14
5. Pleurisy	3			2	1			3																2	1								1		1				1		3
6. Congestion of the Lungs (inc. pul. apoplexy)	4	1		5			5			4					1														1	1	1			1			1				5
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	15	11		21	5		9	16	1	6	1				1						1	1		2	7	4	3		2	7	5		3	1	2		3		2	1	26
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the stomach	1			1				1															1										1								1
2. Other Diseases of Stomach (cancer excepted)																																									
3. Infant. Diarr. and Gastro-Ent. (cholera infan.)	2	2		4			1			4																									1	2	1				4
4. Diarrhœa and Enteritis (not infantile)																																									
5. Dysentery																																									
6. Hernia and Intestinal obstructions		1				1		1																1									1								1
7. Other Diseases of the Intestines	1				1		1																		1															1	1
8. Diseases of the Liver	1				1			1																		1												1			1
9. Peritonitis (not puerperal)	1	2		2	1		1	2											1					1	1				1				1	1							3
10. Iliac Abscess and Appendicitis	1			1				1																	1							1									1
Total	7	5		8	3	1	6	6		4									1				1	2	3	1			1			1	3	1	1	2	1	1		1	12
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	1	1		2			1	1										1						1							1				1						2
2. Bright's Disease	1	1		1	1			2													1			1							1				1						2
3. Other Diseases of the Kidneys and Adnexa	1				1			1																			1									1					1
4. Vesical Calculi																																									
5. Diseases of the Bladder	1				1			1																			1						1								1
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of Female Genital Organs																																									
Total	4	2		3	3		1	5										1			1			2			2				2		1		2	1						6
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicæmia																																									
2. Puerperal Albuminuria and Convul.		1		1				1															1										1								1
3. Other accidents of Pregnancy, sudden death		1		1				1											1													1									1
4. Puerperal Diseases of the Breast																																									
Total		2		2				2											1				1									1	1								2

WOODSTOCK.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas		1		1			1			1																						1									1
2. Skin and Adnexa (cancer excepted)																																									
Total		1		1			1			1																						1									1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still Births	5			3			3			3																					1	1					1				3
2. Congen. Debil. and Malformations	8	9		17			17			17																			2	1	2		2	3	4		1	1	1		17
3. Other Diseases of Infancy																																									
4. Senile Decay	16	10		2	24		2	24																	1	6	19		1	4	1	3	5	1	3	2	2		1	3	26
Total	27	19		22	21		22	24		20															1	6	19		3	5	4	4	7	4	7	2	4	1	2	3	46
XII. SUICIDE.																																									
1. Poison	1			1				1																	1							1									1
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total	1			1				1																	1							1									1
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lightning																																									
4. Drowning																																									
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	5			3	1	1	1	4										1	2	1	1																5				5
8. Burns and Scalds																																									
9. Homicide																																									
10. Other accidents	2			1	1			2															1		1									1			1				2
Total	7			4	2	1	1	6										1	2	1	1		1		1									1			6				7
XIV. ILL DEFINED CAUSES.																																									
1. Tetanus	1			1				1																1					1												1
2. Tumors	2	1		2	1		2	1							1				1							1									1	1			1		3
3. Other ill-defined causes	7	1		5	3		3	5		1							1		1						4		1		1		2	1	1		1			1	1		8
4. Heart failure	1	1			2			2																1	1							2									2
Total	11	3		8	6		5	9		1					1		1		2					2	5	1	1		2		2	3	1		2	1		1	2		14
Total from all causes	107	83		122	66	2	71	117	2	36	1	1			4	3	3	4	11	4	7	5	7	16	27	27	34		15	25	21	20	23	9	17	14	18	9	11	8	190

CAUSES OF DEATHS BY CITIES IN 1904—PETERBOROUGH.

	Sex			Nativity			Social conditions.			Ages. Under 5.																		Months.												
General Diseases.	Male.	Female.	Not stated	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated	0-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over	Not given.	January.	February.	March	April.	May.	June	July	August	September.	October.	November	December	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	2	5		3	1	3	1	4	2								1	1	2	1		1	1									1		4		1				1	7
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	1				1		1							1																							1				1
5. Whooping Cough																																									
6. Diphtheria and Croup	6	6		12			11	1			1	2	1		5			1			2								2	1	2		1	1	2		1			2	12
7. Influenza	2	1		1	2			3																1		1	1		1	2											3
8. Other Epidemic Diseases																																									
Total	11	12		16	4	3	13	8	2		1	2	1	1	5		1	2	2	1	2	1	1	1		1	1		3	3	2	1	1	5	2	1	2			3	23
II. OTHER GENERAL DISEASES.																																									
1. Pyæmia and Septicæmia	2	1		2	1		1	2								1		1								1							1	1			1				3
2. Malarial Fever		1		1			1										1																		1						1
3. Tuberculosis and Scrofula	13	17		25	4	1	20	9	1						1	3	4	10	2	3	1	3	2		1				2	1	2	1	5	6	2	5		1	2	3	30
4. Syphilis																																									
5. Cancer	2	5		4	3		1	6														1	3		3				2	1		1	1						1	1	7
6. Rheumatism and Gout		2		2			1	1											1						1				1									1			2
7. Diabetes																																									
8. Other General Diseases		3		2		1		3															1	1			1						1	1		1					3
9. Alcoholism, Acute and Chronic	1			1				1																	1															1	1
Total	18	29		37	8	2	21	22	1						1	4	5	11	3	3	1	4	6	1	6	1	1		5	2	2	2	8	8	3	6	1	2	3	5	47
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis	1			1				1																1											1						1
2. Simple Meningitis	1	1		2			2			1							1												1					1							2
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of Brain	3	2		1	1			1	1										1					1	1		2		1	1							2			1	5
5. Softening of the Brain	1			1				1																	1								1								1
6. Paralysis without specified cause	7	3		4	6		2	8										1						4		2	3			1		1	1	1	1	1	2	1	1		10
7. Insanity		1				1	1										1																						1		1
8. Epilepsy	1			1			1													1										1											1
9. Convulsions (not puerperal)	1			1			1			1																													1		1
10. Other Nervous Diseases	1				1			1																		1			1												1
Total	16	7		11	11	1	7	15	1	2							2	1	1	1				6	2	3	5		3	3		1	2	2	2	1	4	1	3	1	23

PETERBOROUGH.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis		1			1			1																			1										1				1
3. Organic Heart Diseases	7	8		8	6	1	2	13							1					1		1		2	6	3	1			1	3		1	4	1	1	1	2		1	15
4. Angina Pectoris	1				1			1																	1															1	1
5. Disease of Arteries, Atheroma, Aneurism, etc.	1			1				1																			1									1					1
6. Other Diseases of the Circulatory System																																									
Total	9	9		9	8	1	2	16							1					1		1		2	7	3	3			1	3		1	4	1	2	2	2		2	18
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	4	2		3	3		2	4		2														1	2	1			1	1				1					1	2	6
2. Chronic Bronchitis		1			1			1																	1										1						1
3. Broncho-pneumonia																																									
4. Pneumonia	10	4		9	5		8	6		2	1					1	2		1	1		1		1	2	1	1		1	1	2	2	2	1			1	2	2		14
5. Pleurisy	1			1				1														1																	1		1
6. Congestion of the Lungs (incl. pul. apoplexy)																																									
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	15	7		13	9		10	12		4	1					1	2		1	1		2		2	5	2	1		2	2	2	2	2	2	1		1	2	4	2	22
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the stomach	1			1			1															1													1						1
2. Other Dis's. of the Stomach (cancer excepted)	1				1			1																		1						1									1
3. Infan. Diarr. and Cholera Infantum	3	3		6			6			6																			1						2	3					6
4. Diarrhoea and Enteritis (not infantile)	1				1			1																			1									1					1
5. Dysentery																																									
6. Hernia and Intestinal obstructions	1				1			1																		1				1											1
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	2			2			2													1					1								1			1					2
9. Peritonitis (not puerperal)																																									
10. Iliac Abscess and Appendicitis	2			2				2											1			1								1										1	2
Total	11	3		11	3		9	5		6									1	1		2			1	2	1		1	2		1	1		3	5				1	14
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	4			3	1		1	3									1							1	2						1							1		2	4
2. Bright's Disease	4	3		1	6		1	6													1			1	1	2	1	1		1	1	2	1			1			1		7
3. Other Diseases of the Kidneys and Adnexa																																									
4. Vesical Calculi																																									
5. Diseases of the Bladder	1			1				1																	1														1		1
6. Diseases of the Male Genital Organs	1				1			1																	1													1			1
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs		1		1			1												1												1										1
Total	10	4		6	8		3	11									1		1		1			2	5	2	1	1		1	3	2	1			1		2	2	2	14
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions		2		1	1			2											1		1																1			1	2
3. Other accidents of Pregnancy (sudden death)																																									
4. Puerperal Disease of the Breast																																									
Total		2		1	1			2											1		1																1			1	2

IX. DISEASES OF THE SKIN																																								
1. Erysipelas																																								
2. Skin and Adnexa (cancer excepted)																																								
Total																																								
X. LOCOMOTOR SYSTEM																																								
1. Pott's Disease																																								
2. Diseases of the Bones and Joints																																								
3. Amputation (for unspecified Diseases)																																								
Total																																								
XI. MALFORMATIONS, ETC																																								
1. Still Births	13	3	1	17			17			17																				5	3	1	1		3	2		1	1		17
2. Congen. Debility and Malformation	17	8		25			25			24		1																	2	1	4	3	2	1		6	3	1	1	1	25
3. Other Diseases of Infancy																																									
4. Senile Decay	9	14		4	19		1	22																		6	17		2	3	1	1	1	2	1	2	2	2	3	3	23
Total	39	25	1	46	19		43	22		41		1														6	17		1	9	8	5	1	3	4	10	5	4	5	4	65
XII. SUICIDE																																								
1. Poison	1	1			2			2														1					1				1							1			2
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total	1	1			2			2														1					1				1							1			2
XIII. ACCIDENTS																																								
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lightning																																									
4. Drowning																																									
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	1			1				2												1														1							1
8. Burns and Scalds																																									
9. Homicide																																									
10. Other accidents	3	4		4	3		1	5	1			1						1						2		3			2		1			1						3	7
Total	4	4		5	3		1	6	1			1						1		1				2		3			2		1			2						3	8
XIV. ILL DEFINED CAUSES																																								
1. Dropsy	2			2				2																	2							1	1								2
2. Tumors		1		1				1														1										1									1
3. Other Ill Defined Causes	2	2		4				4														2		1	1						1	1		1					1		4
4. Heart Failure		2		2				2										1						1					1		1										2
Total	4	5		9				9										1				3		2	3				1		2	3	1	1					1		9
Total from all causes	138	108	1	164	76	7	112	130	5	53	2	4	1	1	7	5	11	16	10	9	5	14	7	18	29	23	31	1	21	23	24	17	21	27	16	26	16	14	18	24	247

CAUSES OF DEATHS BY TOWNS IN 1904.—BERLIN.

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social Con. Single.	Social Con. Married.	Social Con. Not stated.	Ages. Under 5. 0	1	2	3	4	5-9.	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 and over.	Not given	Months. January	February	March	April	May	June	July	August	September	October	November	December	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever		1		1			1										1																			1					1
2. Smallpox																																									
3. Measles		1		1			1			1																				1											1
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup	2	2		4			4			1					1	1		1																					2	2	4
7. Influenza	2	2		2	2			1	3											1							1	2		2	2										4
8. Other Epidemic Diseases																																									
Total	4	6		8	2		6	1	3	2					1	1	1	1		1							1	2		3	2					1			2	2	10
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia		1		1				1																	1									1							1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	5	5		10				3	7									1	2	1		3		1		2						2	1		1	1	2	2		1	10
4. Syphilis																																									
5. Cancer	4	3		3	4		1	2	4												1				1	4	1				1		2	1		1		2			7
6. Rheumatism and Gout																																									
7. Diabetes		1			1			1																	1												1				1
8. Other General Diseases																																									
9. Alcoholism, Acute and Chronic																																									
Total	9	10		14	5		1	7	11									1	2	1	1	3		1	3	6	1				1	2	3	2	1	2	3	4		1	19
Local Diseases.																																									
III. NERVOUS SYSTEM																																									
1. Encephalitis																																									
2. Simple Meningitis		1		1			1			1																					1										1
3. Epidemic Cerebro spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	4	4		3	5			3	5												1				2		3	2	2	1		1	2						1	1	8
5. Softening of the Brain		1		1				1																	1								1								1
6. Paralysis without specified cause	3	1		1	3				4																1	2		1								2	1			1	4
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	3	3		6			6			5		1																	1			1		1	1	2					6
10. Other Nervous Diseases		2		2				1	1			1							1																1		1				2
Total	10	12		14	8		7	5	10	6		2							1		1				4	2	3	3	3	1	1	2	3	1	2	4	2		1	2	22

IV CIRCULATORY SYSTEM:																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	6	6		5	7			4	8								1	1				1	2		1	4	2		1		3	3	1	1			1		1	1	12
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.	1				1				1															1								1									1
6. Other Diseases of Circulatory System																																									
Total	7	6		5	8			4	9								1	1				1	2	1	1	4	2		1		3	4	1	1			1		1	1	13
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	2	1		1	2		1	1	1	1															1		1		1				1				1				3
2. Chronic Bronchitis		1			1			1																	1				1												1
3. Broncho pneumonia																																									
4. Pneumonia	2	1		2	1		1		2		1								1					1						1			1	1							3
5. Pleurisy																																									
6. Congestion of the Lungs	1	2		1	1	1		2	1									1	1							1				1		2									3
7. Asthma and Emphysema																																									
8. Other Diseases of the Respiratory System																																									
Total	5	5		4	5	1	2	4	4	1	1							1	2					1	2	1	1		2	2		2	2	1			1				10
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1			1					1											1												1									1
2. Other Diseases of Stomach (cancer excepted)																																									
3. Infantile Diarrhœa and Cholera Infantum	1	1		2			2			1	1																								1				1		2
4. Diarrhœa and Enteritis (not infantile)	1	1		1	1		1		1				1														1		1						1						2
5. Dysentery																																									
6. Hernia and Intestinal obstructions		1			1			1																		1							1								1
7. Other Diseases of the Intestines		1		1				1												1										1											1
8. Diseases of the Liver	1			1					1																1					1											1
9. Peritonitis (not puerperal)																																									
10. Iliac Abscess and Appendicitis		1				1	1										1																	1							1
Total	4	5		6	2	1	4	2	3	1	1		1				1			2					1	1	1		1	2		1	1	1	2				1		9
VII. GENITO-URINARY SYSTEM																																									
1. Acute Nephritis																																									
2. Bright's Disease	2				2			2																			2				1						1				2
3. Other Diseases of Kidneys and Adnexa																																									
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of Female Genital Organs																																									
Total	2				2			2																			2				1						1				2
VIII. PUERPERAL DISEASES																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other accidents of Preg. and sudden death																																									
4. Puerperal Diseases of the Breast																																									
Total																																									

BERLIN.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation for unspecified Diseases																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	4			4			4			4																			1				1				2				4
2. Congen. Debil. and Malformations	5	6		11			11			11																			1		2			1		1	1	2	2	1	11
3. Other diseases of Infancy		2		2			2			2																												1		1	2
4. Senile Decay	8	9		3	14			17																		7	10		3			1	2		1		4	4	2		17
Total	17	17		20	14		17	17		17																7	10		5		2	1	3	1	1	1	7	7	4	2	34
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation	1			1			1																1													1					1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Not Stated	1	1		1	1		1	1										1							1										2						2
Total	2	1		2	1		2	1										1					1		1										2	1					3
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	1	1		1	1			2																1		1								1		1					2
2. Gunshot																																									
3. Lightning																																									
4. Drowning	1			1			1										1																	1							1
5. Electric Cars	1				1			1																			1							1							1
6. Bicycles																																									
7. Railways	1				1				1														1																	1	1
8. Burns and Scalds		2		1	1		1	1				1														1						1						1			2
9. Homicide																																									
10. Other accidents	1			1				1																	1											1					1
Total	5	3		4	4		[illegible]	5	1			1					1						1	1	1	2	1					1		3		2		1		1	8
XIV. ILL-DEFINED CAUSES																																									
1. Dropsy	1				1			1																		1								1							1
2. Tumors																																									
3. Other Ill-defined Causes																																									
4. Heart Failure	2	1		3			2		1		1											1			1								1		1		1				3
Total	3	1		3	1		2	1	1		1											1			1	1							1	1	1		1				4
Total from all causes	**68**	**66**		**80**	**52**	**2**	**43**	**49**	**42**	**27**	**3**	**3**	**1**	**1**	**1**	**1**	**5**	**6**	**4**	**4**	**3**	**2**	**5**	**10**	**15**	**21**	**22**		**12**	**8**	**10**	**13**	**14**	**11**	**9**	**11**	**16**	**12**	**9**	**9**	**134**

CAUSES OF DEATHS BY TOWNS IN 1904.—BROCKVILLE.

General Diseases.	Sex.			Nativity.			Social Con.			Ages. Under 5.																		Months.												Totals.
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0. 1.	1. 2.	3. 4.	5-9.	10-14.	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79.	80 and over.	Not given.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	5	1		5	1		4	2									1	1	3				1							1	2	1	1				1				6
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever		2		2			2						1		1																			1	1						2
5. Whooping Cough																																									
6. Diphtheria and Croup	3	2		4	1		4	1			1		1		1				1		1									1	1	1		1		1					5
7. Influenza	1	1		2			2			2																				1		1									2
8. Other Epidemic Diseases																																									
Total	9	6		13	2		12	3		2	1		2		2		1	1	4		1		1							3	3	3	1	2	1	1	1				15
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1			1			1					1																			1										1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	11	7		14	3	1	9	7	2								2	3		5	4	2		1				1			2	2	2	3	1	5	1		1	1	18
4. Syphilis																																									
5. Cancer	1	4		3	2			4	1											1		1		2	1					1				2		1	1				5
6. Rheumatism and Gout																																									
7. Diabetes																																									
8. Other General Diseases	1	1		2			1	1											1						1				1		1										2
9. Alcoholism, Acute and Chronic																																									
Total	14	12		20	5	1	11	12	3			1					2	3	1	6	4	3		3	2			1	1	1	4	2	2	5	1	6	2		1	1	26
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	1	2		3			3			1	1								1												2					1					3
3. Epidemic Cerebro-spinal Meningitis		1		1			1			1																													1		1
4. Congestion and Hemorrhage of Brain	1	4		4	1		1	4								1									1	2	1					1	1				1	1		1	5
5. Softening of the Brain																																									
6. Paralysis without specified cause	2	3		3	2			5														1		1		1	2		1		1		1	1		1					5
7. Insanity																																									
8. Epilepsy		1		1			1													1										1											1
9. Convulsions (not puerperal)		1			1		1										1																	1							1
10. Other Nervous Diseases	1			1				1																		1														1	1
Total	5	12		13	4		7	10		2	1					1	1		1	1		1		1	1	4	3		1	1	3	1	2	2		2	1	1	1	2	17

BROCKVILLE.—*Continued.*

Number of column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IV. CIRCULATORY SYSTEM.																				
1. Pericarditis																				
2. Endocarditis	3			2	1		1	2									1			
3. Organic Heart Disease	6	5		9	2		1	10												
4. Angina Pectoris	1			1			1											1		
5. Diseases of Arteries, Atheroma, Aneurism, etc.																				
6. Other Diseases of the Circulatory System																				
Total	10	5		12	3		3	12									1	1		
V. RESPIRATORY SYSTEM.																				
1. Acute Bronchitis																				
2. Chronic Bronchitis																				
3. Broncho-pneumonia	3			2		1	2	1			2									
4. Pneumonia	5	3		6	2		1	4			2	1			1					
5. Pleurisy		1		1				1												
6. Congestion of the Lungs, (inc. pul. apoplexy)	1			1			1									1				
7. Asthma and Emphysema																				
8. Other Diseases of the Respiratory System																				
Total	9	4		10	2	1	7	6			1	1			1	1				
VI. DIGESTIVE SYSTEM.																				
1. Ulcer of the Stomach																				
2. Other Diseases of Stomach (cancer excepted)	3	1		4			1	3												
3. Infantile Diarrhoea and Cholera Infantum	3	4		7			7			7										
4. Diarrhoea and Enteritis (not infantile)																				
5. Dysentery	1	1		2			2						1				1			
6. Hernia and Intestinal obstructions																				
7. Other Diseases of the Intestines	1			1				1												
8. Diseases of the Liver	2			1		1		2												
9. Peritonitis (not puerperal)	1				1			1												
10. Iliac Abscess and Appendicitis																				
Total	11	6		15	1	1	10	7		7			1				1			
VII. GENITO-URINARY SYSTEM.																				
1. Acute Nephritis	3			2	1		2	1			1	1								
2. Bright's Disease	1	1		2				2												
3. Other Diseases of the Kidneys and Adnexa	1			1				1												
4. Vesical Calculi																				
5. Diseases of the Bladder																				
6. Diseases of the Male Genital Organs																				
7. Metritis																				
8. Other Diseases of the Uterus																				
9. Ovarian Cysts and Ovarian Tumors																				
10. Other Diseases of the Female Genital Organs																				
Total	5	1		5	1		2	4			1	1								

Number of column	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																					
1. Pericarditis																					
2. Endocarditis		2																	2		3
3. Organic Heart Disease				2	1	3	2		1	1	1	1			2	2	1		1	1	11
4. Angina Pectoris													1								1
5. Diseases of Arteries, Atheroma, Aneurism, etc.																					
6. Other Diseases of the Circulatory System																					
Total		2		2	4	3	2		1	1	1	2	1		2	2	1		3	1	15
V. RESPIRATORY SYSTEM.																					
1. Acute Bronchitis																					
2. Chronic Bronchitis																					
3. Broncho-pneumonia					1					1	1	1									3
4. Pneumonia	1	1			1		1			2	1		1						2	2	8
5. Pleurisy					1													1			1
6. Congestion of the Lungs, (inc. pul. apoplexy)															1						1
7. Asthma and Emphysema																					
8. Other Diseases of the Respiratory System																					
Total	1	1			3		1			3	2	1	1		1			1	2	2	13
VI. DIGESTIVE SYSTEM.																					
1. Ulcer of the Stomach																					
2. Other Diseases of Stomach (cancer excepted)				1	2	1			1								2	1			4
3. Infantile Diarrhoea and Cholera Infantum										1						6					7
4. Diarrhoea and Enteritis (not infantile)																					
5. Dysentery																2					2
6. Hernia and Intestinal obstructions																					
7. Other Diseases of the Intestines				1																1	1
8. Diseases of the Liver				2										1			1				2
9. Peritonitis (not puerperal)				1									1								1
10. Iliac Abscess and Appendicitis																					
Total				5	2	1			1	1			1	1		8	3	1		1	17
VII. GENITO-URINARY SYSTEM.																					
1. Acute Nephritis						1						1	1	1							3
2. Bright's Disease			1		1												1	1			2
3. Other Diseases of the Kidneys and Adnexa					1								1								1
4. Vesical Calculi																					
5. Diseases of the Bladder																					
6. Diseases of the Male Genital Organs																					
7. Metritis																					
8. Other Diseases of the Uterus																					
9. Ovarian Cysts and Ovarian Tumors																					
10. Other Diseases of the Female Genital Organs																					
Total			1		2	1						1	2	1			1	1			6

VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicaemia																																								1
2. Puerperal Albuminuria and Convulsions		1		1				1																																
3. Other Accidents of Pregnancy, sudden death																																								
4. Puerperal Diseases of the Breast																																								
Total		1		1				1																																1
IX. THE SKIN.																																								
1. Erysipelas																																								
2. Skin and Adnexa (cancer excepted)																																								
Total																																								
X. LOCOMOTOR SYSTEM.																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation (for unspecified disease)																																								
Total																																								
XI. MALFORMATIONS, ETC.																																								
1. Still Births	8	5		13			13			13																														13
2. Congen. Debility and Malformation	11	6		16	1		17			17																														17
3. Other Diseases of Infancy																																								
4. Senile Decay	8	9		8	8	1		17																																17
Total	27	20		37	9	1	30	17		30																														47
XII. SUICIDE.																																								
1. Poison																																								
2. Strangulation																																								
3. Gas Poisoning																																								
4. Drowning																																								
5. Firearms																																								
Total																																								
XIII. ACCIDENT.																																								
1. Fractures and Dislocations	2			1	1		2																																	2
2. Gunshot	2			2			2																																	2
3. Lightning																																								
4. Drowning																																								
5. Electric Cars																																								
6. Bicycles																																								
7. Railways																																								
8. Burns and Scalds																																								
9. Homicide		1		1			1			1																														1
10. Other Accidents		1		1			1																																	1
11. Poison																																								
Total	4	2		5	1		6			1																														6
XIV. ILL-DEFINED CAUSES.																																								
1. Dropsy	1			1				1																																1
2. Tumors	3	2		2	3		2	3																																5
3. Other Ill-Defined Causes	1			1				1																																1
4. Heart Failure																																								
Total	5	2		4	3		2	5																																7
Total from all causes	99	71		135	31	4	90	77	3	42	7	3	3	1	3	3	6	8	8	7	6	8	2	15	15	17	15	1	10	15	21	16	13	16	10	27	15	6	12	9	170

CAUSES OF DEATHS BY TOWNS IN 1904.—CORNWALL.

General Diseases.	Sex.			Nativity			Social Conditions			Ages. Under 5.																			Months.												
	Male.	Female	Not stated.	Canada.	Foreign.	Not stated	Single.	Married.	Not stated.	0.1	1	2.	3	4	5-9	10-14	15-19.	20-24	25-29	30-34	35-39	40-44	45-49	50-59.	60-69	70-79.	80 and over.	Not given.	January.	February	March.	April.	May	June	July.	August	September	October	November.	December	Totals
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	3			3			1	1	1									1			2													1		1	1				3
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough																																									
6. Diphtheria and Croup		1		1			1					1																									1				1
7. Influenza																																									
8. Other Epidemic Diseases																																									
Total	3	1		4			2	1	1			1						1			2													1		1	2				4
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia	1			1					1												1																1				1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	11	16		21	3		17	10					1		2		3	3	5	2	3	2	2		4				2	1	3	4	5		3	5	1	1		2	27
4. Syphilis																																									
5. Cancer	1	4		4		1	1	4																2	1	2				1	1					1	2				5
6. Rheumatism and Gout																																									
7. Diabetes																																									
8. Other General Diseases	1			1				1														1																		1	1
9. Alcoholism, Acute and Chronic																																									
Total	14	20		30	3	1	18	15	1				1		2		3	3	5	2	4	3	2	2	5	2			2	2	4	4	5		3	6	4	1		3	34
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis		1		1				1																1									1								1
2. Simple Meningitis	4			3	1		4			1					1	1	1																				2		1	1	4
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	3	1		3	1			4																2	1		1					1		1					1	1	4
5. Softening of the Brain																																									
6. Paralysis without specified cause		2		1	1			2																1	1											1				1	2
7. Insanity		1		1			1																1															1			1
8. Epilepsy																																									
9. Convulsions (not puerperal)	1	1		2			2			2																							1		1						2
10. Other Nervous Diseases																																									
Total	8	6		11	3		7	7		3					1	1	1						1	4	2		1					1	2	1	1	1	2	1	2	3	14

IV. CIRCULATORY SYSTEM.																																			
1. Pericarditis																																			
2. Endocarditis																																			
3. Organic Heart Diseases	2	3		4	1		1	4				1							1	1	2						2			1		1	1			5
4. Angina Pectoris	1			1				1											1								1									1
5. Arteries, Atheroma, Aneurism, etc.	1			1				1											1															1		1
6. Other Diseases of Circulatory System																																			
Total	4	3		6	1		1	6				1							3	1	2						3			1		1	1	1		7
V. RESPIRATORY SYSTEM																																			
1. Acute Bronchitis	1	1		2			2			2														1		1										2
2. Chronic Bronchitis	1			1				1														1											1			1
3. Broncho pneumonia		2		2			1	1		1											1						1	1								2
4. Pneumonia	3	4		6	1		1	6			1							1		3	2			1	1	1	1	2					1			7
5. Pleurisy	2			1		1	1		1											1		1				2										2
6. Congestion of the Lungs (inc. pul. apoplexy)																																			
7. Asthma and Emphysema																																			
8. Other Diseases of Respiratory System																																			
Total	7	7		12	1	1	5	8	1	3	1						1			4	3	2		2	1	4	2	3					2			14
VI. DIGESTIVE SYSTEM																																			
1. Ulcer of the Stomach																																			
2. Other Diseases of Stomach (cancer excepted)	1			1			1										1												1							1
3. Infant. Diarr. and Gastro-Ent. (cholera infan.)																																			
4. Diarrhœa and Enteritis (not infantile)		1		1				1							1																1					1
5. Dysentery																																			
6. Hernia and Intestinal obstructions	1			1				1								1															1					1
7. Other Diseases of the Intestines	1			1			1								1																			1		1
8. Diseases of the Liver																																			
9. Peritonitis (not puerperal)		1		1			1							1																1						1
10. Iliac Abscess and Appendicitis	1	2		3			2	1					1	1				1								1					1	1				3
Total	4	4		8			5	3					1	2	2	1	1	1								1			1	1	3	1		1		8
VII. GENITO-URINARY SYSTEM.																																			
1. Acute Nephritis		1		1				1											1						1											1
2. Bright's Disease	1	1		1	1			2												1	1			1										1		2
3. Other Diseases of the Kidneys and Adnexa	2				1	1	1	1											1				1		1										1	2
4. Vesical Calculi																																			
5. Diseases of the Bladder																																			
6. Diseases of the Male Genital Organs																																			
7. Metritis																																			
8. Other Diseases of the Uterus																																			
9. Ovarian Cysts and other Ovarian Tumors																																			
10. Other Diseases of Female Genital Organs																																			
Total	3	2		2	2	1	1	4											2	1	1		1	1	2									1	1	5
VIII. PUERPERAL DISEASES																																			
1. Puerperal Septicæmia																																			
2. Puerperal Albuminuria and Convul.		1		1				1								1															1					1
3. Other accidents of Pregnancy, sudden death																																			
4. Puerperal Diseases of the Breast																																			
Total		1		1				1								1															1					1

CORNWALL.—*Concluded.*

Number of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified Disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	5			5			5																							2			3								5
2. Congen. Debil. and Malformations	8	1		9			9			9																				2	2	1						2	1	1	9
3. Other Diseases of Infancy																																									
4. Senile Decay	11	12		17	4	2	7	16																		4	18	1	3	5	5	2	2	1		1	1		1	2	23
Total	24	13		31	4	2	21	16		14																4	18	1	3	9	7	3	5	1		1	1	2	2	3	37
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Not stated																																									
Total																																									
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	1				1		1									1																					1				1
2. Gunshot																																									
3. Lightning																																									
4. Drowning	4			3	1		3	1						1	1	1		1														1	1	1	1						4
5. Electric Cars																																									
6. Bicycles																																									
7. Railways																																									
8. Burns and Scalds	1	1		2			2								1			1															1	1							2
9. Homicide																																									
10. Other accidents																																									
Total	6	1		5	2		6	1						1	2	2		2														1	2	2	1		1				7
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy																																									
2. Tumors																																									
3. Other Ill-Defined Causes		2		2				2																		2					1				1						2
4. Heart Failure																																									
Total		2		2				2																		2					1				1						2
Total from all causes	73	60		111	16	5	66	64	3	20	1	2	1		5	3	6	6	9	4	6	5	4	11	13	14	21	2	8	14	17	14	17	6	8	13	12	7	7	10	133

CAUSES OF DEATHS BY CITIES IN 1904—LINDSAY.

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Soc'l con. Single.	Soc'l con. Married.	Soc'l con. Not stated.	Ages. Under 5. 0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80 & over.	Not given	Months. Jan	Feb.	March.	April.	May	June.	July	Aug.	Sept	Oct.	Nov.	Dec	Total.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	2	1		2		1	2	1							1						1			1											1		1	1			3
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	1		3			3					2	1																	1	2										3
5. Whooping Cough																																									
6. Diphtheria and Croup																																									
7. Influenza	1	1			2			2																			2			1		1									2
8. Other Epidemic Diseases																																									
Total	5	3		5	2	1	5	3				2	1		1						1			1			2			2	2	1			1		1	1			8
II. OTHER GENERAL DISEASES																																									
1. Pyaemia and Septicaemia	2			1	1		2			1								1														1							1		2
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	2	13		14	1		9	6								3	3	1	1	2	1		1		2				1	2	1	2	2		2	1	1	1	1	1	15
4. Syphilis																																									
5. Cancer	2	3		5				5														2	1		2				1			1	1		1					1	5
6. Rheumatism and Gout	1	1		2			2														1	1								1			1								2
7. Diabetes		2		1	1		1	1							1									1										1				1			2
8. Other General Diseases																																									
9. Alcoholism, Acute and Chronic	1					1	1																	1														1			1
Total	8	19		23	3	1	15	12		1					1	3	3	3	1	2	2	3	2	2	4				2	3	1	4	4	1	3	1	1	3	2	2	27
Local Diseases.																																									
III. DISEASES OF NERVOUS SYSTEM AND ORGANS OF SENSE																																									
1. Encephalitis																																									
2. Simple Meningitis	1	3		4			3	1		1	1				1						1												1	1					1	1	4
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of Brain	3	1		2	2			4																		4			1		2									1	4
5. Softening of the Brain																																									
6. Paralysis without specified cause	1	1		2				2																1		1												2			2
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	3			3			3			2		1																						1		1		1			3
10. Other Nervous Diseases																																									
Total	8	5		11	2		6	7		3	1	1			1						1			1		5			1		2		1	2		1		3	1	2	13

LINDSAY.—*Continued*.

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IV. CIRCULATORY SYSTEM.																				
1. Pericarditis																				
2. Endocarditis	1			1				1												
3. Organic Heart Diseases	3	3		4	2		2	1							2	1				
4. Angina Pectoris																				
5. Diseases of Arteries, Atheroma, Aneurism, etc																				
6. Other Diseases of Circulatory System																				
Total	1	3		5	2		2	5							2	1				
V. RESPIRATORY SYSTEM.																				
1. Acute Bronchitis	2	2		3	1		2	2		1		1								
2. Chronic Bronchitis	1			1				1												
3. Broncho Pneumonia	1			1			1			1										
4. Pneumonia	1	2		1	5			6												
5. Pleurisy		1		1			1										1			
6. Congestion of the lungs (inc. pul. apoplexy)	1				1		1				1									
7. Asthma and Emphysema																				
8. Other Diseases of the Respiratory System																				
Total	9	5		7	7		5	9		2	1	1					1			
VI. DIGESTIVE SYSTEM.																				
1. Ulcer of the Stomach																				
2. Other Dis's. of the Stomach (cancer excepted)	1			1			1								1					
3. Infan. Diarr. and Cholera Infantum																				
4. Diarrhoea and Enteritis (not Infantile)	1			1			1					1								
5. Dysentery																				
6. Hernia and Intestinal obstructions		1		1				1												
7. Other Diseases of the Intestines																				
8. Diseases of the Liver	1			1				1												
9. Peritonitis (not puerperal)		2		1	1		1	1											2	
10. Iliac Abscess and Appendicitis		3		3			3								1		1			
Total	3	6		8	1		6	3				1			2		1		2	
VII. GENITO-URINARY SYSTEM.																				
1. Acute Nephritis																				
2. Bright's Disease	2			1	1			2												
3. Other Diseases of Kidneys and Adnexa																				
4. Vesical Calculi																				
5. Diseases of the Bladder																				
6. Diseases of the Male Genital Organs																				
7. Metritis		1		1				1										1		
8. Other Diseases of the Uterus																				
9. Ovarian Cysts and other Ovarian Tumors																				
10. Other Diseases of the Female Genital Organs																				
Total	2	1		2	1			3										1		

Number of Column.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																					
1. Pericarditis																					
2. Endocarditis			1															1			1
3. Organic Heart Diseases					1		2			3			1				1		1		6
4. Angina Pectoris																					
5. Diseases of Arteries, Atheroma, Aneurism, etc																					
6. Other Diseases of Circulatory System																					
Total			1		1		2			3			1				1	1	1		7
V. RESPIRATORY SYSTEM.																					
1. Acute Bronchitis					1	1				1									1	2	1
2. Chronic Bronchitis				1								1									1
3. Broncho Pneumonia																				1	1
4. Pneumonia	1				3	1	1				2	1			1	1			1		6
5. Pleurisy															1						1
6. Congestion of the lungs (inc. pul. apoplexy)																				1	1
7. Asthma and Emphysema																					
8. Other Diseases of the Respiratory System																					
Total	1			1	1	2	1			1	2	2			2	1			2	4	14
VI. DIGESTIVE SYSTEM.																					
1. Ulcer of the Stomach																					
2. Other Dis's. of the Stomach (cancer excepted)														1							1
3. Infan. Diarr. and Cholera Infantum																					
4. Diarrhoea and Enteritis (not Infantile)												1									1
5. Dysentery																					
6. Hernia and Intestinal obstructions					1															1	1
7. Other Diseases of the Intestines																					
8. Diseases of the Liver			1										1								1
9. Peritonitis (not puerperal)										1					1						2
10. Iliac Abscess and Appendicitis	1										1				2						3
Total	1		1		1					1	1	1	1	1	3					1	9
VII. GENITO-URINARY SYSTEM.																					
1. Acute Nephritis																					
2. Bright's Disease				1	1					1					1						2
3. Other Diseases of Kidneys and Adnexa																					
4. Vesical Calculi																					
5. Diseases of the Bladder																					
6. Diseases of the Male Genital Organs																					
7. Metritis											1										1
8. Other Diseases of the Uterus																					
9. Ovarian Cysts and other Ovarian Tumors																					
10. Other Diseases of the Female Genital Organs																					
Total					1	1				1	1				1						3

VIII. PUERPERAL DISEASES.																																								
1. Puerperal Septicaemia																																								
2. Puerperal Albuminuria and Convulsions																																								
3. Other Accidents of Pregnancy, sudden death																																								
4. Puerperal Disease of the Breast																																								
Total																																								
IX. THE SKIN.																																								
1. Erysipelas																																								
2. Skin and Adnexa (cancer excepted)																																								
Total																																								
X. LOCOMOTOR SYSTEM																																								
1. Pott's Disease																																								
2. Diseases of Bones and Joints																																								
3. Amputation for unspecified Diseases																																								
Total																																								
XI. MALFORMATIONS, ETC																																								
1. Still Births	1	1		2			2			2																					1							1		2
2. Congenital Debility and Malformations	3	5		5			5			5																		1	1			1					1	1	3	8
3. Other Diseases of Infancy	1	1		2			2			2																				1						1				2
4. Senile Decay	8	6		7	7			15	1															1	6	7		3	3		1	1				1	3	2		11
Total	13	13	..	19	7		12	13	1	12														1	6	7		4	4	1	2	2				2	4	1	3	26
XII. SUICIDE																																								
1. Poison																																								
2. Strangulation																																								
3. Gas Poisoning																																								1
4. Drowning		1		1			1										1																		1					
5. Not Stated	1			1				1														1																	1	1
Total	1	1		2			1	1									1					1													1				1	2
XIII. ACCIDENTS.																																								
1. Fractures and Dislocations																																								
2. Gunshot																																								
3. Asphyxiation																																								
4. Drowning	2				1	1		2														1	1										1				1			2
5. Electric Cars																																								
6. Tetanus																																								
7. Railways	2			2			2									1											1				1		1							2
8. Burns and Scalds																																								
9. Homicide																																								
10. Other Accidents																																								
Total	1			2	1	1	2	2								1						1	1				1				1		2				1			4
XIV. ILL DEFINED CAUSES.																																								
1. Dropsy		1		1				1																1								1								1
2. Tumors		1			1			1												1										1										1
3. Other Ill defined Causes	1			1			1									1																				1				1
4. Heart Failure	1	1		1		1		2													1						1	1				1								2
Total	2	3	..	3	1	1	1	4								1				1	1			1			1	1		1		2				1				5
Total from all causes	59	59	..	87	27	4	55	62	1	18	2	5	1	7	4	7	5	3	2	7	4	6	7	13	13	12	2	8	15	11	11	11	6	10	4	6	13	10	13	118

CAUSES OF DEATHS BY TOWNS IN 1904.—NIAGARA FALLS.

General Diseases.	Sex.			Nativity.			Soc'l con.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0	1	2	3	4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–59	60–69	70–79	80 and over.	Not given	January	February	March	April	May	June	July	August	September	October	November	December	Totals.
Number of column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever		1		1				1										1																	1						1
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever																																									
5. Whooping Cough	1			1			1								1															1											1
6. Diphtheria and Croup	1	2		3			3				1				1			1													1						1			1	3
7. Influenza																																									
8. Other Epidemic Diseases																																									
Total	2	3		5			1	1			1				2			2												1	1				1		1			1	5
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia																																									
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	3	1		4	3			7										1			1	3		1	1				1		1	1	1				1			2	7
4. Syphilis																																									
5. Cancer																																									
6. Rheumatism and Gout																																									
7. Diabetes	1			1				1												1										1											1
8. Other General Diseases																																									
9. Alcoholism, Acute and Chronic																																									
Total	4	4		5	3			8										1		1	1	3		1	1				1	1	1	1	1				1			2	8

Local Diseases.

III. NERVOUS SYSTEM.																																									
1. Encephalitis		1		1			1			1																															
2. Simple Meningitis	1			1			1									1																			1						1
3. Epidemic Cerebro-spinal Meningitis																																							1		1
4. Congestion and Hemorrhage of the Brain		1		1				1																		1					1										1
5. Softening of the Brain																																									
6. Paralysis without specified cause		3		1	2			3																	1	2										1	1		1		3
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	2			2			2			2																			1	1											2
10. Other Nervous Diseases																																									
Total	3	5		6	2		4	4		3						1									1	3			1	1	1				1	2	1		2		8

IV. CIRCULATORY SYSTEM																										
1. Pericarditis																										
2. Endocarditis																										
3. Organic Heart Diseases																										
4. Angina Pectoris																										
5. Arteries, Atheroma, Aneurism, etc																										
6. Other Diseases of Circulatory System																										
Total																										
V. RESPIRATORY SYSTEM.																										
1. Acute Bronchitis	1		1		1					1									1							1
2. Chronic Bronchitis																										
3. Broncho-pneumonia																										
4. Pneumonia	8	3	7	1	3	8	2		1		2	1		4	1	3	1				1			4	2	11
5. Pleurisy																										
6. Congestion of the Lungs, (inc. pul. apoplexy)																										
7. Asthma and Emphysema																										
8. Other Diseases of Respiratory System																										
Total	9	3	8	1	4	8	2		1	1	2	1		1	1	3	1		1		1			4	2	12
VI. DIGESTIVE SYSTEM.																										
1. Ulcer of the Stomach																										
2. Other Dis's. of the Stomach (cancer excepted)																										
3. Infant. Diarr. and Cholera Infantum	2	2	1		1		3	1										1				2	1			4
4. Diarrhoea and Enteritis (not Infantile)	1		1			1							1			1										1
5. Dysentery		2		2		2								1	1						1		1			
6. Hernia and Intestinal obstructions																										
7. Other Diseases of the Intestines																										
8. Diseases of the Liver	1		1			1					1								1							1
9. Peritonitis (not puerperal)																										
10. Iliac Abscess and Appendicitis	1	1	2		2				2							1				1						2
Total	5	5	8	2	6	1		1	2		1		1	1	1	2		1	1	1	1	2	2			10
VII. GENITO URINARY SYSTEM																										
1. Acute Nephritis																										
2. Bright's Disease	1		1		1		1																	1		1
3. Other Diseases of Kidneys and Adnexa	1			1		1								1										1		1
4. Vesical Calculi																										
5. Diseases of the Bladder	1	1		2		2						1			1							1		1		2
6. Diseases of the Male Genital Organs																										
7. Metritis																										
8. Other Diseases of the Uterus																										
9. Ovarian Cysts and other Ovarian Tumors																										
10. Other Diseases of the Female Genital Organs																										
Total	3	1	1	3	1	3	1					1		1	1							1		3		4
VIII. PUERPERAL DISEASES																										
1. Puerperal Septicaemia																										
2. Puerperal Albuminuria and Convulsions																										
3. Other Accidents of Pregnancy, sudden death		1		1		1					1										1					1
4. Puerperal Disease of the Breast																										
Total		1		1		1					1										1					1

NIAGARA FALLS.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of the Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-births	3	5		8			8			8																			1		1		2		2					2	8
2. Congen. Debility and Malformations	12	2		14			14			14																			1	2	1		4	2	1			1	1	1	14
3. Other Diseases of Infancy																																									
4. Senile Decay	7	4		4	7			11																		4	7			1	3		2	1			1			3	11
Total	22	11		26	7		22	11		22																4	7		2	3	5		8	3	3		1	1	1	6	33
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Not stated	1			1				1																		1			1												1
Total	1			1				1																		1			1												1
XIII. ACCIDENTS.																																									
1. Fractures and Dislocations	1			1	3		1	3										1			1					1							1	1	1	1					4
2. Gunshot																																									
3. Drowning																																									
4. Electric Cars																																									
5. Tetanus																																									
6. Railways	3			1	2			1										2						1													1			2	3
7. Burns and Scalds																																									
8. Homicide																																									
9. Other Accidents	5			1	2		1	2											1	1								1		1							1			1	3
10. Asphyxiation	2			2			1	1											1			1																1	1		2
Total	12			5	7		5	7										4	2	1	1	1		1		1		1		1			1	1	1	1	2	1	1	3	12
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy																																									
2. Tumors																																									
3. Other Ill-defined Causes	1	1		1	1			2											1					1							1				1						2
4. Heart Failure	3	2		3	2		1	4								1			1					2	1				1		1	1				1				1	5
Total	4	3		4	3		1	6								1			2					3	1				1		2	1			1	1				1	7
Total from all causes	65	36		68	33		47	54		31	1	1			3	4	1	7	4	5	3	5	1	6	3	15	10	1	11	8	11	2	12	5	10	6	8	9	6	13	101

CAUSES OF DEATHS BY TOWNS IN 1904.—OWEN SOUND.

General Diseases.	Sex. Male.	Sex. Female.	Sex. Not stated.	Nativity. Canada.	Nativity. Foreign.	Nativity. Not stated.	Social Condition. Single.	Social Condition. Married.	Social Condition. Not stated.
Number of Column.	1	2	3	4	5	6	7	8	9
I. COMMUNICABLE (EPIDEMIC) DISEASES.									
1. Tyhoid Fever	2	1		3				3	
2. Smallpox									
3. Measles									
4. Scarlet Fever		1			1		1		
5. Whooping Cough	1	2		3			3		
6. Diphtheria and Croup	1	1		2			2		
7. Influenza	1			1				1	
8. Other Epidemic Diseases									
Total	5	5		9	1		6	4	
II. OTHER GENERAL DISEASES									
1. Pyaemia and Septicaemia									
2. Malarial Fever									
3. Tuberculosis and Scrofula	10	5		14	1		10	5	
4. Syphilis									
5. Cancer	2	8		7	2	1	1	8	1
6. Rheumatism and Gout									
7. Diabetes									
8. Other General Diseases	2	2		4			1	3	
9. Alcoholism, Acute and Chronic									
Total	14	15		25	3	1	12	16	1
Local Diseases.									
III. DISEASES OF NERVOUS SYSTEM									
1. Encephalitis									
2. Simple Meningitis	1	1		2			2		
3. Epidemic Cerebro-spinal Meningitis		1		1			1		
4. Congestion and Hemorrhage of the Brain		3		1	2			3	
5. Softening of the Brain									
6. Paralysis without specified cause	4	2		2	4		1	5	
7. Insanity									
8. Epilepsy	1			1			1		
9. Convulsions (not puerperal)	4			4			4		
10. Other Nervous Diseases	2			1	1			2	
Total	12	7		12	7		9	10	

General Diseases.	Ages. Under 5. 0.1	1.	2.	3.	4.	5–9	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 and over.	Not given.
Number of Column.	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
I. COMMUNICABLE (EPIDEMIC) DISEASES.																			
1. Tyhoid Fever									1	1					1				
2. Smallpox																			
3. Measles																			
4. Scarlet Fever							1												
5. Whooping Cough	2	1																	
6. Diphtheria and Croup						2													
7. Influenza																	1		
8. Other Epidemic Diseases																			
Total	2	1				2	1		1	1					1		1		
II. OTHER GENERAL DISEASES																			
1. Pyaemia and Septicaemia																			
2. Malarial Fever																			
3. Tuberculosis and Scrofula		1				1		1	3	3	3			1	2				
4. Syphilis																			
5. Cancer											1	1	1	1	4	1	1		
6. Rheumatism and Gout																			
7. Diabetes																			
8. Other General Diseases									1	1				1		1			
9. Alcoholism, Acute and Chronic																			
Total		1				1		1	1	4	4	1	1	3	6	2	1		
Local Diseases.																			
III. DISEASES OF NERVOUS SYSTEM																			
1. Encephalitis																			
2. Simple Meningitis	1										1								
3. Epidemic Cerebro-spinal Meningitis	1																		
4. Congestion and Hemorrhage of the Brain																1	2		
5. Softening of the Brain																			
6. Paralysis without specified cause																2	3	1	
7. Insanity																			
8. Epilepsy										1									
9. Convulsions (not puerperal)	2	2																	
10. Other Nervous Diseases															1		1		
Total	4	2								1	1				1	3	6	1	

General Diseases.	Months. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Number of Column.	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.													
1. Tyhoid Fever										1	1	1	3
2. Smallpox													
3. Measles													
4. Scarlet Fever									1				1
5. Whooping Cough		1						1				1	3
6. Diphtheria and Croup		1										1	2
7. Influenza			1										1
8. Other Epidemic Diseases													
Total		2	1					1	1	1	1	3	10
II. OTHER GENERAL DISEASES													
1. Pyaemia and Septicaemia													
2. Malarial Fever													
3. Tuberculosis and Scrofula	2	2	1	1	2		3			2		2	15
4. Syphilis													
5. Cancer	1	1			2		3				2	1	10
6. Rheumatism and Gout													
7. Diabetes													
8. Other General Diseases						1	1				1	1	4
9. Alcoholism, Acute and Chronic													
Total	3	3	1	1	4	1	7			2	3	4	29
Local Diseases.													
III. DISEASES OF NERVOUS SYSTEM													
1. Encephalitis													
2. Simple Meningitis								1			1		2
3. Epidemic Cerebro-spinal Meningitis											1		1
4. Congestion and Hemorrhage of the Brain			1	1						1			3
5. Softening of the Brain													
6. Paralysis without specified cause		2			1		2		1				6
7. Insanity													
8. Epilepsy							1						1
9. Convulsions (not puerperal)	1			1			1			1			4
10. Other Nervous Diseases			1						1				2
Total	1	2	2	2	1		4	1	2	2	2		19

OWEN SOUND.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis		1			1		1																			1											1				1
3. Organic Heart Diseases	7	13		9	11		4	14	2							1			1	1			2	3	6	5	1		2	3	2	1	2	3	1			2	1	3	20
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System																																									
Total	7	14		9	12		5	14	2							1			1	1			2	3	6	6	1		2	3	2	1	2	3	1		1	2	1	3	21
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	5	3		7	1		4	1		4													1		2		1				2	1							4	1	8
2. Chronic Bronchitis																																									
3. Broncho pneumonia	2			2			1	1			1												1									1						1			2
4. Pneumonia	1	4		5	3		2	6									1		1		1				5	2	1		1	1	2					1				3	8
5. Pleurisy	1				1			1																	1					1											1
6. Congestion of the Lungs	2			2			1	1		1													1								1	1									2
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	11	7		16	5		8	13		5	1						1		1		1		3		6	2	2		1	2	5	3				1		1	4	4	21
VI. DIGESTIVE SYSTEM																																									
1. Ulcer of the Stomach	1				1			1																	1											1					1
2. Other Dis's. of Stomach (cancer excepted)		3		2	1		1	2																	3						2								1		3
3. Infan. Diarr. and Cholera Infantum	5	2		7			7			5	2																				1	2		1			1	1		1	7
4. Diarrhœa and Enteritis (not infantile)																																									
5. Dysentery																																									
6. Hernia and Intestinal obstructions	1			1				1																	1													1			1
7. Other Diseases of the Intestines	1				1			1																		1								1							1
8. Diseases of the Liver	1				1				1													1																		1	1
9. Peritonitis (not puerperal)	1	1		1		1	2								1		1													1		1									2
10. Iliac Abscess and Appendicitis	1			1				1											1											1											1
Total	11	6		12	4	1	10	6	1	5	2				1		1		1			1			5	1				2	3	3		2		1	1	2	1	2	17
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease																																									
3. Other Diseases of the Kidneys and Adnexa	2			2			2						2																										2		2
4. Vesical Calculi																																									
5. Diseases of the Bladder	3			2	1			3																	1	1	1			1				1			1				3
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	5			4	1		2	3					2												1	1	1			1				1			1		2		5
VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions		1		1				1										1													1										1
3. Other accidents of Pregnancy (sudden death)		1		1				1													1														1						1
4. Puerperal Disease of the Breast																																									
Total		2		2				2										1			1										1				1						2

IX. THE SKIN																																									
1. Erysipelas	1				1			1																1															1		1
2. Skin and Adnexa (cancer excepted)																																									
Total	1				1			1																1															1		1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified Disease)																																									
Total																																									
XI. MALFORMATIONS, ETC																																									
1. Still-Births	6	2		8			8			8																					2	1		1	1	1			2		8
2. Congenital Debility and Malformations	10	3		13			13			13																			3	1	2	1		1		1	2			2	13
3. Other Diseases of Infancy																																									
4. Senile Decay	7	18		4	21		1	21																	1	11	13		3	7	1	2	1	4	2			1	2	2	25
Total	23	23		25	21		22	21		21															1	11	13		6	8	5	4	1	6	3	2	2	1	4	1	46
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation	1				1			1																	1															1	1
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total	1				1			1																	1															1	1
XIII. ACCIDENT.																																									
1. Fractures and Dislocations																																									
2. Gunshot	1			1			1																														1				1
3. Lightning																																									
4. Drowning	4			3	1		2	2				1			1				1			1	1									1			2		1				4
5. Electric Cars																																									
6. Bicycles																																									
7. Railways																																									
8. Burns and Scalds																																									
9. Homicide																																									
10. Other accidents	3			3			2	1		1								1		1										1								1		1	3
Total	8			7	1		5	3		1		1			1			1	1	1		1	1							1		1			2		2	1		1	8
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	1			1					1															1					1												1
2. Tumors																																									
3. Other Ill-defined Causes	2	1		3			1		2															1	1			1			1	2									3
4. Heart Failure	1				1			1																	1				1												1
Total	4	1		1	1		1	1	3															2	2			1	2		1	2									5
Total from all causes	105	80	.	125	58	2	80	68	7	38	7	1	2	0	5	2	3	7	9	7	3	3	9	14	27	29	18	1	15	24	21	17	8	13	18	6	10	12	19	22	185

CAUSES OF DEATHS BY TOWNS, IN 1904.—KENORA.

General Diseases.	Sex.			Nativity.			Social Con.			Ages. Under 5.					Ages.														Months.												Totals.
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0.	1.	2.	3.	4.	5–9.	10–14	15–19	20–24.	25–29.	30–34	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 and over	Not given.	Jan.	Feb.	March.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	6	1		1	6		6	1									1	3	2			1							1	1							1	2	2		7
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	2		4			4					1			3															1	1				2						4
5. Whooping Cough																																									
6. Diphtheria and Croup	5			4	1		3	2					1		1			2						1						1									2	2	5
7. Influenza																																									
8. Other Epidemic Diseases																																									
Total	13	3		9	7		13	3				1	1		4		1	5	2			1		1					1	3	1				2		1	2	4	2	16
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicaemia																																									
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	6	1		3	1		5	2									2		1	1		1	1	1							1					2		1	2	1	7
4. Syphilis																																									
5. Cancer	2	1		1	2			3													1			1			1				1		1							1	3
6. Rheumatism and Gout		1			1			1														1												1							1
7. Diabetes																																									
8. Other General Diseases																																									
9. Alcoholism, Acute and Chronic																																									
Total	8	3		4	7		5	6									2		1	1	1	2	1	2			1				2		1	1		2		1	2	2	11
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	2			2			1	1							1				1																			1		1	2
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of Brain																																									
5. Softening of the Brain																																									
6. Paralysis without specified cause	2	3		2	3		1	4									1					1		2		1					2					1	1		1		5
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	2	1		3			3			1	1	1																			1	1		1							3
10. Other Nervous Diseases																																									
Total	6	4		7	3		5	5		1	1	1			1		1		1			1		2		1					3	1		1		1	1	1	1	1	10

IV.—CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Diseases	2	2		2	2		2	2							1				1			1	1						1	1							1	1			4
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of Circulatory System																																									
Total	2	2		2	2		2	2							1				1			1	1						1	1							1	1			4
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	3	1		4			4			4																				1	2								1		4
2. Chronic Bronchitis																																									
3. Broncho pneumonia																																									
4. Pneumonia	3	4		5	2		4	3							1		1	2	1	1		1								1		1	1	1					1	2	7
5. Pleurisy		1		1				1																1									1								1
6. Congestion of the Lungs, including pul. apop.		1		1			1					1																				1									1
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	6	7		11	2		9	1		4		1			1		1	2	1	1		1		1						2	2	2	2	1					2	2	13
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)																																									
3. Infantile Diarrhœa and Cholera Infantum		3		3			3			3																										3					3
4. Diarrhœa and Enteritis (not infantile)																																									
5. Dysentery	1				1		1																	1											1						1
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver																																									
9. Peritonitis (not puerperal)																																									
10. Iliac Abscess and Appendicitis																																									
Total	1	3		3	1		4			3														1											1	3					4
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease																																									
3. Other Diseases of Kidneys and Adnexa																																									
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total																																									
VIII. PUERPERAL DISEASES.																																									
1. Peurperal Septicaemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other Accidents of Pregnancy, sudden death																																									
4. Puerperal Disease of the Breast																																									
Total																																									

KENORA.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified diseases)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still Births																																									
2. Congen. Debility and Malformation	6	2		8			8			8																							1		2	1	2	1		1	8
3. Other Diseases of Infancy																																									
4. Senile Decay	5	2		2	5		1	6																		4	3			1		1	1		1	1	2				7
Total	11	1		10	5		9	6		8																4	3			1		1	2		3	2	4	1		1	15
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENT.																																									
1. Fractures and Dislocations																																									
2. Gunshot																																									
3. Lightning																																									
4. Drowning	5			2	3		3	1	1							1		1		2								1					1	2	1	1					5
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	7			2	5		2	3	2								1	1			2			2				1		1					2	2			1	1	7
8. Burns and Scalds																																									
9. Homicide																																									
10. Other Accidents	6			3	3		1	1	1									2	1	1			1	1							2					1	1			2	6
Total	18			7	11		9	5	4							1	1	4	1	3	2		1	3				2		1	2		1	2	3	4	1		1	3	18
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	1				1				1								1																	1							1
2. Tumors																																									
3. Other Ill-Defined Causes	1	1		1	1		1	1									1						1						1	1											2
4. Heart Failure	4				4			4													3		1								1		1			1			1		4
Total	6	1		1	6		1	5	1								2				3		2						1	1	1		1	1		1			1		7
Total from all causes	71	27		54	44		57	36	5	16	1	3	1		7	1	8	11	7	5	6	6	5	10		5	4	2	3	9	11	4	7	6	9	3	8	6	11	11	98

CAUSES OF DEATHS BY TOWNS IN 1904.—SARNIA.

General Diseases.	Sex: Male.	Sex: Female.	Sex: Not stated.	Nativity: Canada.	Nativity: Foreign.	Nativity: Not stated.	Soc'l con.: Single.	Soc'l con.: Married.	Soc'l con.: Not stated.	Ages: Under 5: 0-1	Ages: Under 5: 1	Ages: Under 5: 2	Ages: Under 5: 3	Ages: Under 5: 4	Ages: 5-9	Ages: 10-14.	Ages: 15-19	Ages: 20-24	Ages: 25-29	Ages: 30-34.	Ages: 35-39	Ages: 40-44.	Ages: 45-49	Ages: 50-59	Ages: 60-69	Ages: 70-79.	Ages: 80 & over.	Ages: Not given.	Months: January.	Months: February.	Months: March.	Months: April	Months: May.	Months: June	Months: July.	Months: August	Months: Sept	Months: Oct	Months: Nov.	Months: Dec.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE DISEASES.																																									
1. Typhoid Fever	1	2		1	2		1	2											1			1		1												1		1	1		3
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever		1		1			1						1																									1			1
5. Whooping Cough	1	1		2			2			1	1																				1		1								2
6. Diphtheria and Croup	1			1			1						1																	1											1
7. Influenza		1			1			1																			1		1												1
8. Other Epidemic Diseases																																									
Total	3	5		5	3		5	3		1	1		2						1			1		1			1		1	1	1		1			1		2	1		8
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicemia		3		1	2			3											1	1	1								1	1			1								3
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	6	11		19	1		10	10			1				1	1	1	3		3	3		1	1	1	1			2	1	1	1	3	6	2		2		1	1	20
4. Syphilis																																									
5. Cancer	8	3		7	4		2	9										1				2	1		5	2			1	1	1	1	1		1	3	1			1	11
6. Rheumatism and Gout																																									
7. Diabetes																																									
8. Other General Diseases																																									
9. Alcoholism, Acute and Chronic	1			1			1											1													1										1
Total	15	20		28	7		13	22			1				1	1	1	5	1	4	4	2	2	1	6	3			4	3	3	2	5	6	3	3	3		1	2	35
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis	1	1		1	1		1	1							1						1																	2			2
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	4	2		3	3			6														1			1	4				1	2		1					2			6
5. Softening of the Brain																																									
6. Paralysis without specified cause	6	1		1	6			7														1		1	2	2	1		2			1	2		1					1	7
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	1	3		4			4			4																			1						1	1		1			4
10. Other Nervous Diseases	1			1				1																1														1			1
Total	13	7		10	10		5	15		4					1						1	2		2	3	6	1		3	1	2	1	3		2	1		6		1	20

SARNIA.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM																																									
1. Pericarditis																																									
2. Endocarditis																																									
3. Organic Heart Disease	1	3		3	1		1	3									1							1	1		1								1			1		2	4
4. Angina Pectoris																																									
5. Arteries, Atheroma, Aneurism, etc.																																									
6. Other Diseases of the Circulatory System																																									
Total	1	3		3	1		1	3									1							1	1		1								1			1		2	4
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	1	1		1	1		1	1		1															1					1				1							2
2. Chronic Bronchitis																																									
3. Broncho-pneumonia	2	1		3			3			1		1				1																	2					1			3
4. Pneumonia	2	5		4	3		3	4									1							2	3	1			1	1	3			1						1	7
5. Pleurisy		1			1		1																			1													1		1
6. Congestion of the Lungs, inc. pul. apoplexy																																									
7. Asthma and Emphysema		1		1				1																	1														1		1
8. Other Diseases of the Respiratory System																																									
Total	5	9		9	5		8	6		2		1				1	1							2	5	2			1	2	3		2	2				1	2	1	14
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach	1			1				1													1																	1			1
2. Other Diseases of Stomach (cancer excepted)																																									
3. Infantile Diarrhœa and Cholera Infantum	2	5		7			7			7																									3	3	1				7
4. Diarrhœa and Enteritis (not infantile)	1				1			1																		1										1					1
5. Dysentery																																									
6. Hernia and Intestinal obstructions																																									
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver	1	1		1	1			2													1						1					1						1			2
9. Peritonitis (not puerperal)	1	2		3			1	2									1			1				1					1	1								1			3
10. Iliac Abscess and Appendicitis																																									
Total	6	8		12	2		8	6		7							1			1	2			1		1	1		1	1		1			3	4	1	3			14
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis																																									
2. Bright's Disease	3	1		2	2		1	3														1			2	1			1	1							1	1			4
3. Other Diseases of Kidneys and Adnexa		1		1				1											1																	1					1
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the Female Genital Organs																																									
Total	3	2		3	2		1	4											1			1			2	1			1	1						1	1	1			5

VIII. PUERPERAL DISEASES.																																									
1. Puerperal Septicemia																																									
2. Puerperal Albuminuria and Convulsions																																									
3. Other accidents of Pregnancy, sudden death																																									
4. Puerperal Disease of the Breast																																									
Total																																									
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Other Dis. of Skin and Adnexa (cancer except.)																																									
Total																																									
X. LOCOMOTOR SYSTEM																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation (for unspecified Dis.)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-births	2	3		5			5			5																			1					1	2			1			5
2. Congen. Debility and Malformations	6	4		10			10			10																				1						1	4	2	1	1	10
3. Other Diseases of Infancy																																									
4. Senile Decay	10	3		3	10			13																		8	5		1			2		1	2	1	1	3	2		13
Total	18	10		18	10		15	13		15																8	5		2	1		2		2	4	2	5	6	3	1	28
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
6. Not stated	2				1	1		1	1																1	1												1		1	2
Total	2				1	1		1	1																1	1												1		1	2
XIII. ACCIDENTS																																									
1. Fractures and Dislocations	2			2			1	1										1							1					1					1						2
2. Gunshot		1			1			1															1																	1	1
3. Lightning																																									
4. Drowning	3			3			3										1	1			1																	1	2		3
5. Electric Cars																																									
6. Asphyxiation	5			4	1		1	4											1	1		2	1															5			5
7. Railways	1			1				1											1										1												1
8. Burns and Scalds																																									
9. Homicide																																									
10. Other Accidents	2			2				2																1	1						1								1		2
11. Poison	1				1			1																		1							1								1
Total	14	1		12	3		5	10									1	2	2	1	1	2	2	1	2	1			1	1	1		1		1			6	3	1	15
XIV. ILL-DEFINED CAUSES.																																									
1. Dropsy	2			1	1			2																		2							1					1			2
2. Tumors	1	1		2			1	1									1		1																		1			1	2
3. Other Ill-Defined Causes	1	2		2	1			3										1					2																1	2	3
4. Heart Failure		2		2				2														1		1					1						1						2
Total	4	5		7	2		1	8									1	1	1			1	2	1		2			1				1		1		1	1	1	3	9
Total from all causes	84	70	....	107	46	1	62	91	1	29	2	1	2	.	2	2	9	8	6	6	8	9	6	10	20	25	9	.	15	11	10	6	13	10	15	12	11	28	11	12	64

CAUSES OF DEATHS BY TOWNS IN 1904.—SAULT STE. MARIE.

General Diseases.	Sex.			Nativity.			Social con.			Ages. Under 5.					Ages.														Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0.	1.	2.	3.	4.	5–9.	10–14.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45–49.	50–59.	60–69.	70–79.	80 and over	Not given.	January	February	March.	April	May.	June	July.	August	September.	October	November	December	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	1	1			2		1		1									1	1											1					1						2
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	2	1		3			3			1		1			1																	1				2					3
5. Whooping Cough																																									
6. Diphtheria and Croup																																									
7. Influenza																																									
8. Other Epidemic Diseases																																									
Total	3	2		3	2		4		1	1		1			1			1	1											1		1			1	2					5
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicemia		1			1				1										1																				1		1
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	10	1		7	3	1	9	1	1					2	1	1	2	4	1			1						2	3	2	2		1		2	1	1		1	1	11
4. Syphilis																																									
5. Cancer	1	4		1	1	3		5														1	2		2					1	1	2						1			5
6. Rheumatism and Gout		1				1	1								1																			1							1
7. Diabetes																																									
8. Other General Diseases		1		1				1											1														1								1
9. Alcoholism, Acute and Chronic																																									
Total	11	11		9	5	8	10	10	2					2	2	1	2	4	3			2	2		2			2	3	3	3	2	2	1	2	1	1	1	2	1	22
Local Diseases.																																									
III. NERVOUS SYSTEM.																																									
1. Encephalitis																																									
2. Simple Meningitis		1		1			1			1																								1							1
3. Epidemic Cerebro-spinal Meningitis																																									
4. Congestion and Hemorrhage of the Brain	1			1				1																1										1							1
5. Softening of the Brain																																									
6. Paralysis without specified cause	1	1			2			1	1																1			1						1					1		2
7. Insanity																																									
8. Epilepsy																																									
9. Convulsions (not puerperal)	1			1			1				1																		1												1
10. Other Nervous Diseases		1				1		1													1														1						1
Total	3	3		3	2	1	2	3	1	1	1										1			1	1			1	1					3	1				1		6

IV. CIRCULATORY SYSTEM.		
1. Pericarditis	2 1 1 1 1 1 1 1 1	2
2. Endocarditis		
3. Organic Heart Diseases	5 1 3 2 1 2 4 1 1 1 1 1 1 2 1 1 2	6
4. Angina Pectoris		
5. Diseases of Arteries, Atheroma, Aneurism, etc.		
6. Other Diseases of the Circulatory System		
Total	7 1 3 3 2 3 5 1 1 1 2 1 1 1 2 1 1 1 1 2	8
V. RESPIRATORY SYSTEM		
1. Acute Bronchitis	1 1 1 1 1	1
2. Chronic Bronchitis	1 1 1 1 1	1
3. Broncho pneumonia		
4. Pneumonia	7 2 5 2 2 6 2 1 3 1 1 1 1 1 1 2 2 1 1 1 1 1	9
5. Pleurisy		
6. Congestion of the Lungs (inc. pul. apoplexy)	1 1 1 1 1	1
7. Asthma and Emphysema		
8. Other Diseases of the Respiratory System	1 1 1 1 1	1
Total	10 3 7 3 3 9 3 1 3 1 2 2 1 1 1 1 1 2 2 2 2 1 2 2	13
VI. DIGESTIVE SYSTEM.		
1. Ulcer of the Stomach		
2. Other Dis's. of the Stomach (Cancer excepted)		
3. Infan. Diarr. and Cholera Infantum	2 2 3 1 1 1 2 1 1	4
4. Diarrhœa and Enteritis (not infantile)		
5. Dysentery		
6. Hernia and Intestinal obstructions		
7. Other Diseases of the Intestines		
8. Diseases of the Liver	1 1 1 1 1	1
9. Peritonitis (not puerperal)	1 1 1 1 1	1
10. Iliac Abscess and Appendicitis	1 1 1 1 1 1 1 1 1 1	2
Total	3 5 5 2 1 7 1 4 1 1 1 1 3 1 2 1 1	8
VII. GENITO-URINARY SYSTEM		
1. Acute Nephritis		
2. Bright's Disease	1 1 1 1 2 2 1 1	2
3. Other Diseases of the Kidneys and Adnexa		
4. Vesical Calculi		
5. Diseases of the Bladder	1 1 1 1 1	1
6. Diseases of the Male Genital Organs		
7. Metritis		
8. Other Diseases of the Uterus		
9. Ovarian Cysts and other Ovarian Tumors	1 1 1 1 1	1
10. Other Diseases of the Female Genital Organs		
Total	2 2 1 3 1 3 1 2 1 1 1 2	4
VIII. PUERPERAL DISEASES.		
1. Puerperal Septicemia	1 1 1 1 1	1
2. Puerperal Albuminuria and Convulsions		
3. Other Accidents of Pregnancy—sudden death	2 1 1 2 1 1 1 1	2
4. Puerperal Disease of the Breast		
Total	3 1 2 3 1 1 1 1 1 1	3

SAULT STE. MARIE.—*Concluded.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IX. THE SKIN.																																									
1. Erysipelas																																									
2. Skin and Adnexa (cancer excepted)																																									
Total																																									
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Disease of Bones and Joints																																									
3. Amputation (for unspecified disease)																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still Births	[illegible]	4		10			10			10																			2						2	2	1	2		1	10
2. Congenital Debility and Malformations	8	3		11			11			11																			1		3	5						1	1		11
3. Other Diseases of Infancy																																									
4. Senile Decay	1	1		2	3			5																	1	1	3		1		1	1	1			1					5
Total	18	8		23	3		21	5		21															1	1	3		4		1	6	1		2	3	1	3	1	1	26
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENT																																									
1. Fractures and Dislocations	2				1	1	1		1											1		1									1								1		2
2. Gunshot	1			1			1												1																1						1
3. Lightning	1			1				1											1																	1					1
4. Drowning	4					4	2	2											2			1	1											2		2					4
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	1			1				1										1																					1		1
8. Burns and Scalds																																									
9. Homicide																																									
10. Other Accidents	4	1		1	2	2	4	1										1	1		1			1				1	1						1			1	1	1	5
11. Poisoning		1				1		1										1																						1	1
Total	13	2		4	3	8	8	6	1									3	5	1	1	2	1	1				1	1		1			2	2	3		1	3	2	15
XIV. ILL-DEFINED CAUSES																																									
1. Dropsy																																									
2. Tumors																																									
3. Other Ill-Defined Causes		1		1				1												1																1					1
4. Heart Failure	2	2		3		1	2	2										1	1		1		1						1						1					2	4
Total	2	3		4		1	2	3										1	1	1	1		1						1						1	1				2	5
Total from all causes	72	43		62	24	29	67	42	6	30	2	1	1	2	5	2	5	11	13	2	5	8	6	4	8	1	3	6	10	9	11	11	6	10	12	15	5	7	9	10	115

CAUSES OF DEATHS BY TOWNS, 1904.—TORONTO JUNCTION.

General Diseases.	Sex.			Nativity.			Soc'l con.			Ages. Under 5.																			Months.												
	Male.	Female.	Not stated.	Canada.	Foreign.	Not stated.	Single.	Married.	Not stated.	0	1	1. 2.	3. 4	5-9.	10-14	15-19.	20-24.	25-29.	30-34.	35-39.	40-44.	45-49.	50-59.	60-69.	70-79	80 and over	Not given.	January	February	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
I. COMMUNICABLE (EPIDEMIC) DISEASES.																																									
1. Typhoid Fever	2	2		2	2			3	1								1		1						1	1			1					1		2					8
2. Smallpox																																									
3. Measles																																									
4. Scarlet Fever	1			1			1						1																											1	1
5. Whooping Cough																																									
6. Diphtheria and Croup	4	7		10	1		10	1				1	1	2	2	4								1					1		1	1	1		1	1	1	1	1	2	11
7. Influenza	1			1			1										1													1											1
8. Other Epidemic Diseases																																									
Total	8	9		14	3		12	4	1			1	2	2	2	4	2		1					1	1	1			2	1	1	1	1	1	1	3	1	1	1	3	17
II. OTHER GENERAL DISEASES.																																									
1. Pyaemia and Septicemia	1	1		1	1			2											1						1						1							1			2
2. Malarial Fever																																									
3. Tuberculosis and Scrofula	3	9		11	1		5	7			1					1	1	3	1	2	2				1				2		1	1	2	3	1					2	12
4. Syphilis																																									
5. Cancer	2	4		4	2		1	5										1			1	1		1	1	1			1					2	1		1		1		6
6. Rheumatism and Gout																																									
7. Diabetes																																									
8. Other General Diseases	1	3		2	2		2	2											1				1	1		1			1			2	1								4
9. Alcoholism, Acute and Chronic	1				1			1														1														1					1
Total	8	17		18	7		8	17			1					1	1	4	3	2	3	2	1	2	3	2			4		2	3	3	5	2	1	1	1	1	2	25
Local Diseases.																																									
III. DISEASES OF NERVOUS SYSTEM.																																									
1. Encephalitis	1			1			1			1																												1			1
2. Simple Meningitis	2	1		3			2	1			1						1							1							1		1					1			3
3. Epidemic Cerebro-spinal Meningitis		1		1			1				1																			1											1
4. Congestion and Hemorrhage of Brain	3	8		3	3			6										1	1					1	1	1	1		1	1	1	1			1					1	6
5. Softening of the Brain		1			1			1																1												1					1
6. Paralysis without specified cause		1			1			1																		1					1										1
7. Insanity	1																																								
8. Epilepsy	1	1		2			1	1												1					1							1					1				2
9. Convulsions (not puerperal)	2	5		7			7			7																					2			1	3				1		7
10. Other Nervous Diseases																																									
Total	9	13		17	5		12	10		8	2						1	1	1	1				3	2	2	1		1	2	5	2	1	1	4	1	1	2	1	1	22

TORONTO JUNCTION.—*Continued.*

Number of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
IV. CIRCULATORY SYSTEM.																																									
1. Pericarditis																																									
2. Endocarditis		1		1				1												1										1											1
3. Organic Heart Diseases	4	1		7	1		4	4			1						2			1		1	1	1			1			1			2		1		1	1	2		8
4. Angina Pectoris	1				1			1																		1				1											1
5. Arteries, Atheroma, Aneurism, etc		1			1			1																			1						1								1
6. Other Diseases of Circulatory System																																									
Total	5	6		8	3		4	7			1						2			2		1	1	1		1	2			3			3		1		1	1	2		11
V. RESPIRATORY SYSTEM.																																									
1. Acute Bronchitis	5	7		10	2		10	2		5	1	2	1		1										1	1			2	1	3		1	3	1				1		12
2. Chronic Bronchitis																																									
3. Broncho pneumonia	3	3		6			5	1		1	1															1			2				1	1	1	1					6
4. Pneumonia	5	2		4	3		2	5										1	1						1	1				4	2		1								7
5. Pleurisy		2		1	1			2											1					1							1	1									2
6. Congestion of the Lungs	1	2		3			2	1		1					1											1					1						1	1			3
7. Asthma and Emphysema																																									
8. Other Diseases of Respiratory System																																									
Total	11	16		24	6		19	11		10	2	2	1		2			1	2					1	5	4			4	5	7	1	3	4	2	1	1	1	1		30
VI. DIGESTIVE SYSTEM.																																									
1. Ulcer of the Stomach																																									
2. Other Diseases of Stomach (cancer excepted)	1	1			2		1	1						1												1									1	1					2
3. Infantile Diarrhœa and Cholera Infantum	4			1			1			1																							1		1	2					4
4. Diarrhœa and Enteritis (not infantile)		1		1			1						1																										1		1
5. Dysentery																																									
6. Hernia and Intestinal obstructions	1				1				1																	1			1												1
7. Other Diseases of the Intestines																																									
8. Diseases of the Liver																																									
9. Peritonitis (not Puerperal)	1	2		3			1	2									1		1	1										2				1							3
10. Iliac Abscess and Appendicitis																																									
Total	7	4		8	3		7	3	1	4			1	1			1		1	1						2			1	2			1	1	2	3			1		11
VII. GENITO-URINARY SYSTEM.																																									
1. Acute Nephritis	2	2		3	1			4												2				1		1			1									3			4
2. Bright's Disease	1	2		3			1	2											1	1	1								1			1								1	3
3. Other Diseases of Kidneys and Adnexa																																									
4. Vesical Calculi																																									
5. Diseases of the Bladder																																									
6. Diseases of the Male Genital Organs																																									
7. Metritis																																									
8. Other Diseases of the Uterus																																									
9. Ovarian Cysts and other Ovarian Tumors																																									
10. Other Diseases of the female Genital Organs		2		2				2											1	1														1				1			2
Total	3	6		8	1		1	8											2	4	1			1		1			2			1		1				4		1	9
PUERPERAL DISEASES.																																									
1. Puerperal Septicemia																																									

2. Puerperal Albuminuria and Convulsions																																									
3. Other Accidents of Pregnancy, sudden death		2		1	1			2														2															1	1			2
4. Puerperal Disease of the Breast																																									
Total		2		1	1			2														2															1	1			2
IX. THE SKIN.																																									
1. Erysipelas	1			1					1													1							1												1
2. Skin and Adnexa (cancer excepted)																																									
Total	1			1					1													1							1												1
X. LOCOMOTOR SYSTEM.																																									
1. Pott's Disease																																									
2. Diseases of Bones and Joints																																									
3. Amputation for unspecified Diseases																																									
Total																																									
XI. MALFORMATIONS, ETC.																																									
1. Still-Births	10	2	2	14			11			14																				2	1		1		2	2	2	1	2	1	14
2. Congenital Debility and Malformations	15	8		23			23			21	2																		3	3		5	2		1	3	3	1	1	1	23
3. Other Diseases of Infancy		1		1			1			1																											1				1
4. Senile Decay	3	2		3	2			3	2																	2	3		3				1		1						5
Total	28	13	2	41	2		38	3	2	36	2															2	3		6	5	1	5	4		4	5	6	2	3	2	43
XII. SUICIDE.																																									
1. Poison																																									
2. Strangulation																																									
3. Gas Poisoning																																									
4. Drowning																																									
5. Firearms																																									
Total																																									
XIII. ACCIDENT.																																									
1. Fractures and Dislocations	1			1			1									1																	1								1
2. Gunshot	1				1			1																	1											1					1
3. Lightning																																									
4. Drowning																																									
5. Electric Cars																																									
6. Bicycles																																									
7. Railways	5			1	2		2	1								1	1							1											1	1				1	3
8. Burns and Scalds		1		1			1				1																				1										1
9. Homicide																																									
10. Other accidents	3			3			1	2										1	1				1						1	1							1				3
Total	8	1		6	3		5	4			1					2	1	1	1				1	1	1				1	1	1		1		1	2	1			1	9
XIV. ILL DEFINED CAUSES.																																									
1. Dropsy		2		2				2																		2								1	1						2
2. Tumors		2		1	1			2																		2						1								1	2
3. Other Ill-defined Causes	1	1		2				2									1					1							1							1					2
4. Heart Failure	2	1		1	2		2	1								1					1		1								1	1						1			3
Total	3	6		6	3		2	7								1	1				1	1	1			4			1		1	2		1	1	1		1		1	9
Total from all causes	94	93	2	152	37		108	76	5	58	9	3	4	3	4	8	9	7	11	10	5	7	4	10	12	19	6	.	23	19	18	15	17	14	18	17	13	14	10	11	189